HIV Prevention Trials Network

Media Contact:
Christine Rogers
+1-919.669.3887
chrogers@fhi360.org

New Study Finds Greatly Elevated HIV Infection Rates Among Young Black Gay and Bisexual Men in the U.S.

Study results released today by the HIV Prevention Trials Network (HPTN) show disturbing rates of new HIV infections occurring among black gay and bisexual men in the U.S. (also known as men who have sex with men, or MSM), particularly young black MSM. The HPTN 061 study showed that the overall rate of new HIV infection among black MSM in this study was 2.8% per year, a rate that is nearly 50% higher than in white MSM in the U.S. Even more alarming, HPTN 061 found that young black MSM—those 30 years of age and younger—acquired HIV infection at a rate of 5.9% per year, three times the rate among U.S. white MSM. The overall infection rate among black MSM in this U.S study is comparable to the rate seen in the general populations of countries in sub-Saharan Africa hardest hit by the HIV epidemic. HPTN 061 was a large multi-site study of HIV and black MSM conducted in six U.S. cities, and the first to determine the rate of new HIV infection among such a large prospective cohort of U.S. black MSM (referred to as HIV incidence).

Commenting on the findings, HPTN 061 Study Co-Chair Darrell Wheeler, PhD, MPH, Dean of the School of Social Work at Loyola University said, "We have known that black MSM are affected by HIV at disproportionately higher rates when compared to other MSM in the U.S., but the HPTN 061 HIV incidence rates were extremely high. They make it very clear that we must urgently find and implement ways to stem the spread of HIV among black gay men in this country, and critically among young black gay men."

The HIV incidence results from HPTN 061, presented today at the XIX International AIDS Conference in Washington, D.C. are among the first findings to come out of the study. Other early analyses show that HIV infection in this study population was associated with very high rates of untreated sexually transmitted infections and with poverty. Of the self-reported HIV-negative or unknown HIV status study participants who agreed to be tested at time of enrollment, 12% were HIV-positive. This finding suggests low rates of HIV testing or delays in testing among black MSM. All HIV-infected study participants were referred for HIV care and treatment services. During the study, all participants were offered the chance to work with "peer health navigators" to provide support and to assist them with access to needed services. In addition, they were provided with condoms, testing and referral treatment of sexually transmitted infections, risk reduction counseling and other standard HIV prevention services.

The success of the HPTN 061 in recruiting and retaining black MSM in a year-long study, including 97% uptake of HIV testing, answered a primary objective of the study, and paves the way for the conduct of future HIV prevention research.

"The HPTN 061 study findings are a sobering wake-up call," said Wafaa El-Sadr, MD, MPH Co-Principal Investigator for the HPTN. "These results, and others to be garnered from further analysis of the study, highlight the enormity of the challenges ahead and offer important insights into how to design research studies and programs for prevention of HIV among black MSM."

Further analysis of data from the study is ongoing to assess how HIV risk among black MSM might be affected by childhood experiences, social and sexual networks, discrimination, homophobia, incarceration and barriers to health care. These findings will help inform future research and prevention efforts.

The HPTN 061 study enrolled a total of 1,553 MSM in six U.S. cities; Atlanta, GA, Boston, MA, New York, NY, Los Angeles, CA, San Francisco, CA, and Washington, D.C. and was conducted between 2009-2011. The study is funded by the National Institute of Allergy and Infectious Diseases (NIAID), the National Institute on Drug Abuse (NIDA) and the National Institute of Mental Health (NIMH).

The HIV Prevention Trials Network (HPTN) *is a worldwide collaborative clinical trials network that develops and tests the safety and efficacy of primarily non-vaccine interventions designed to prevent the acquisition and transmission of HIV. The HPTN research agenda is focused primarily on reduction of HIV transmission and acquisition through the use of ART for HIV-infected persons and ARVs as pre-exposure prophylaxis (PrEP) for HIV-negative persons for HIV prevention, reducing the impact of behavioral and biologic co-factors that increase risk of infection, treatment of substance use (particularly injection drug use), behavioral risk reduction interventions, and structural interventions. The highest priority of the HPTN is to develop and implement combination prevention strategies that demonstrate a significant and measurable reduction in HIV incidence in a variety of populations and epidemic settings.*

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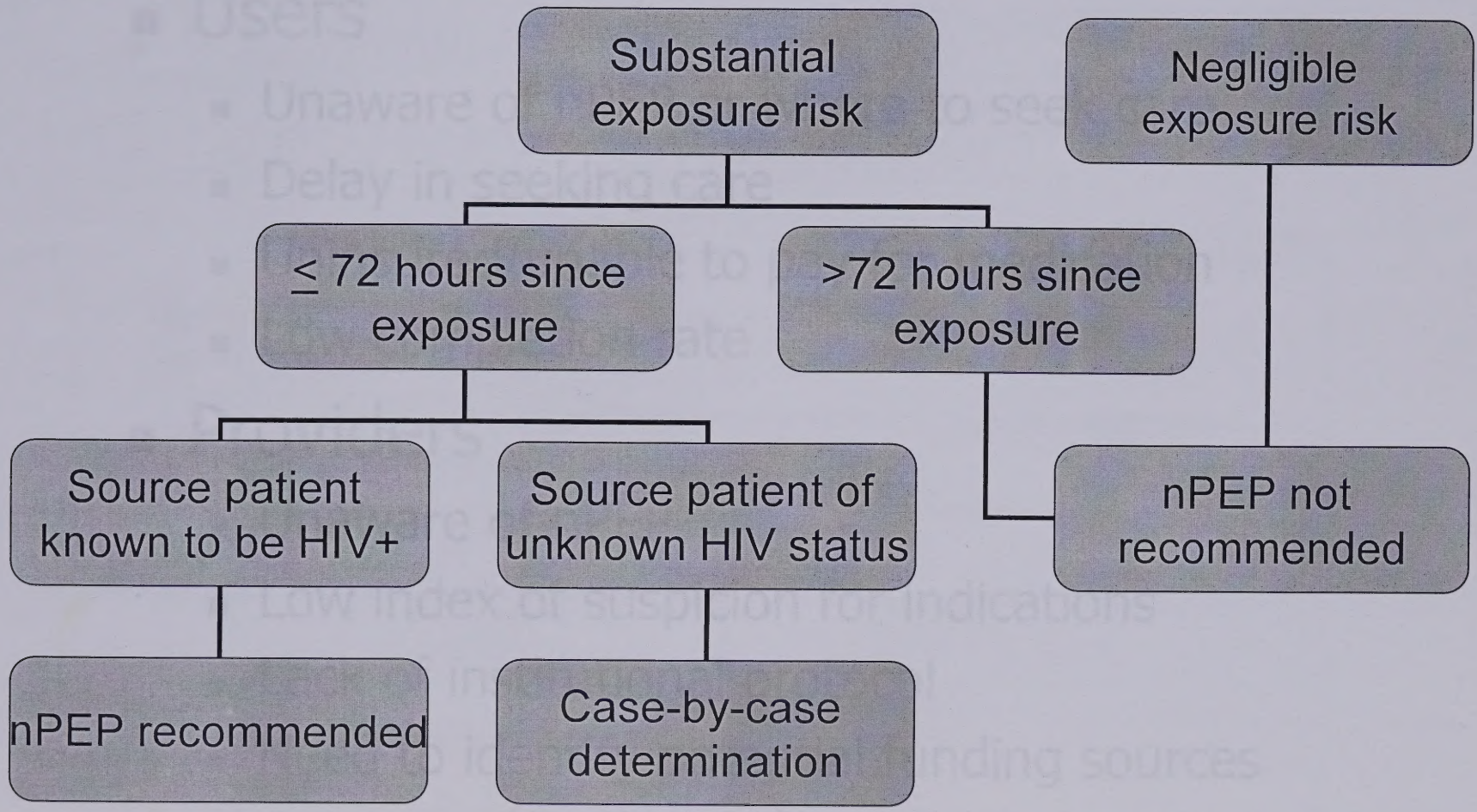
HIV Prevention Trials Network

Preferred ARV Regimens for nPEP

NNRTI based	EFV + (3TC or FTC) + (ZDV or TDF) for 28 days *Do not administer EFV to pregnant women*
PI based	LPV/RTV (Kaletra) + (3TC or FTC) + ZDV for 28 days

Recommendations for nPEP



Barriers to effective use

- Users
  - Unaware of nPEP or where to seek care
  - Delay in seeking care
  - Uninsured/unable to pay for medication
  - Low completion rate
- Providers
  - Unaware of nPEP
  - Low index of suspicion for indications
  - Lack of institutional protocol
  - Need to identify potential funding sources

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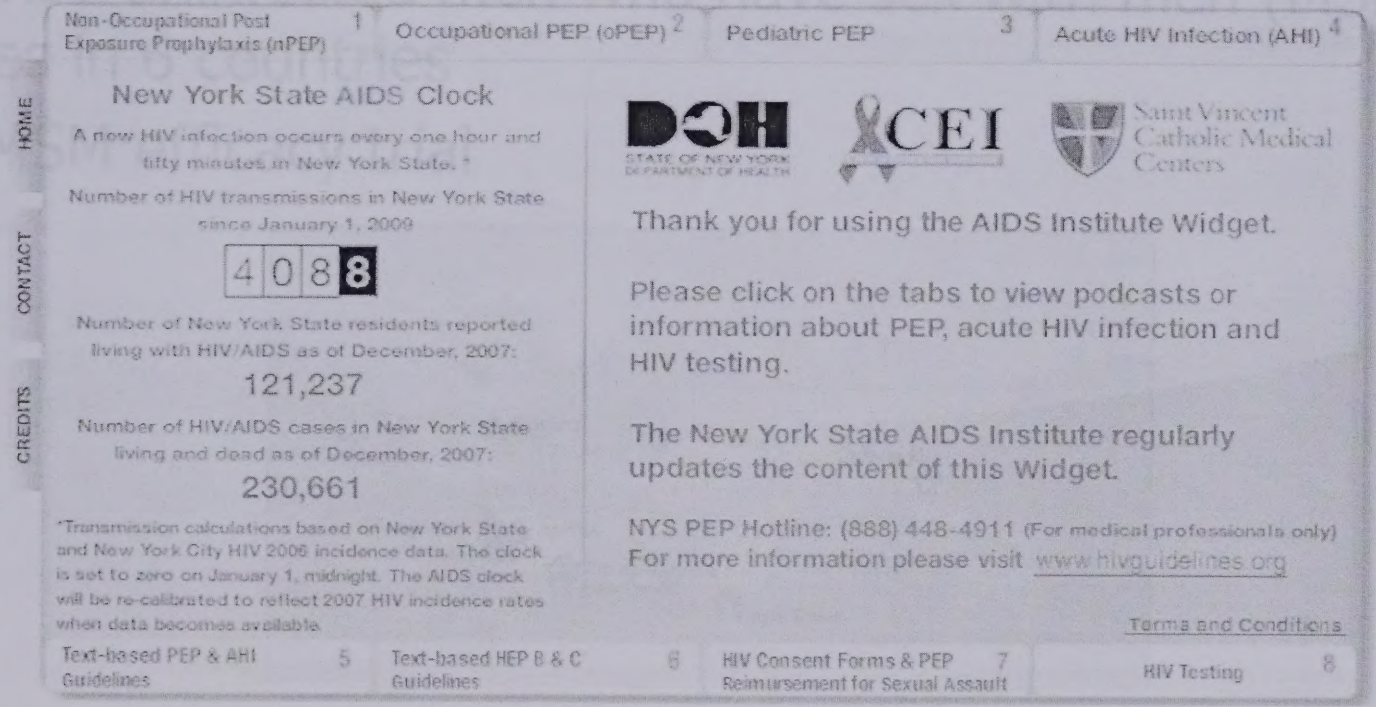
nPEP resources

- http://www.aidsinfo.nih.gov/Guidelines/
- http://www.ceiwidget.com/


Non-Occupational Post Exposure Prophylaxis (nPEP) 1
Occupational PEP (oPEP) 2
Pediatric PEP 3
Acute HIV Infection (AHI) 4
HOME
CONTACT
CREDITS
New York State AIDS Clock
A new HIV infection occurs every one hour and fifty minutes in New York State.*
Number of HIV transmissions in New York State since January 1, 2000
4088
Number of New York State residents reported living with HIV/AIDS as of December, 2007:
121,237
Number of HIV/AIDS cases in New York State living and dead as of December, 2007:
230,661
*Transmission calculations based on New York State and New York City HIV 2006 incidence data. The clock is set to zero on January 1, midnight. The AIDS clock will be re-calibrated to reflect 2007 HIV incidence rates when data becomes available.
DOH
STATE OF NEW YORK DEPARTMENT OF HEALTH
CEI
Saint Vincent Catholic Medical Centers
Thank you for using the AIDS Institute Widget.
Please click on the tabs to view podcasts or information about PEP, acute HIV infection and HIV testing.
The New York State AIDS Institute regularly updates the content of this Widget.
NYS PEP Hotline: (888) 448-4911 (For medical professionals only)
For more information please visit www.hivguidelines.org
Terms and Conditions
Text-based PEP & AHI Guidelines 5
Text-based HEP B & C Guidelines 6
HIV Consent Forms & PEP Reimbursement for Sexual Assault 7
HIV Testing 8

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NIH/Gates iPrEx Trial

- Double-blind randomized controlled trial
- Daily dose of Truvada (tenofovir + emtricitabine) or placebo
- 2500 HIV-uninfected men who have sex with men (MSM) at 11 sites in 6 countries
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Daily Oral PrEP Trials

Efficacy

Population	Study	Location	Results
MSM	iPrEx	Global	2010
IDU	BTS	Thailand	2012
Heterosexual F and M	Partners PrEP	E Africa	2013
Heterosexual F	VOICE	E and S Africa	2013
Heterosexual F	FemPrEP	E and S Africa	2011

Safety

Population	Study	Location	Results
MSM	CDC 4323	US	2010
MSM	ATN 082	US	2011
Heterosexual F	FHI	W Africa	2007
Heterosexual F and M	TDF2	Botswana	2011

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iPrEx Study Design

- Trial participants
  - 2499 HIV-uninfected men who reported:
    - Male sex at birth (29 transgender women)
    - Age 18-67 years
    - Evidence of high risk for HIV acquisition in prior 6 months
  - Multinational sites

Andean (Peru, Ecuador)	1700	(68%)
Brazil	370	(15%)
US	227	(9%)
South Africa	114	(5%)
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iPrEx Efficacy Analyses

Adherence Measure	Subgroup	Efficacy	p-value
Self-report+ Pill count+ Pill dispensing	**Primary analyses**		
	mITT	44%	0.005
	"As Treated"		
	≥50% pill use	50%	0.02
	≥90% pill use	73%	0.36
Drug levels	Drug detected	92%	0.001

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Who are the potential PrEP providers for MSM?

- Primary care clinicians
  - Routine clinical HIV test providers
  - STD clinics
  - Community and rural health centers
  - Providers serving MSM
  - Many others (e.g., HBCU clinics)
- HIV care providers
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Possible PrEP Candidates

- Man ≥ 18 years of age
- Without acute or established HIV infection
- Any male sexual partners in past year
- Not in a monogamous partnership with a recently tested, HIV-negative man

AND (any of the following)

- Any inconsistent condom use in past year
  - Unprotected anal sex (receptive and/or insertive)
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How many potential MSM PrEP users in the US?

- NHANES (2001-2006)*
  - 1.8 million men aged 18-59 years reported sex with a man in prior year and self-identify as gay
    - 47% reported >2 male sex partners in past year
    - 83% HIV-uninfected
- National Survey of Sexual Health and Behavior**
  - No condom use among gay men during most recent sexual event was 39%
- Estimated potential candidates for PrEP-MSM
  - 275,000 uninfected gay men with >2 male sex partners in past year and no condom use at last anal sex

*Xu et al. STD 2010; 37(6):399-405

** Reece et al. J Sex Med 2010;7(suppl 5):266–276

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What do we know about MSM demand for PrEP?

- National HIV Behavioral Survey –Denver
  - If found 75% effective, 87% willing to take PrEP daily to protect themselves from HIV infection
  - If found 50% effective, 73% willing to take daily
- Boston MSM study*
  - 74% reported willingness to use PrEP in future
  - 89% willing to take PrEP for all unprotected anal sex

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Funding Considerations

- Medications (Truvada®) are >80% of program cost
  - 340B price is ~$6,500 per person per year
  - Pharmacy price is ~$11,000 per person per year
- Requires clinician visits for prescription and safety monitoring
- Health department budgets stressed and often do not directly operate clinics that serve MSM
- PrEP users are HIV uninfected, so ineligible for Ryan White or ADAP services
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DHAP Next Steps

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- Communications and Stakeholder Engagement
- Technical Assistance and Training
- Monitoring and Evaluation
- Implementation Science
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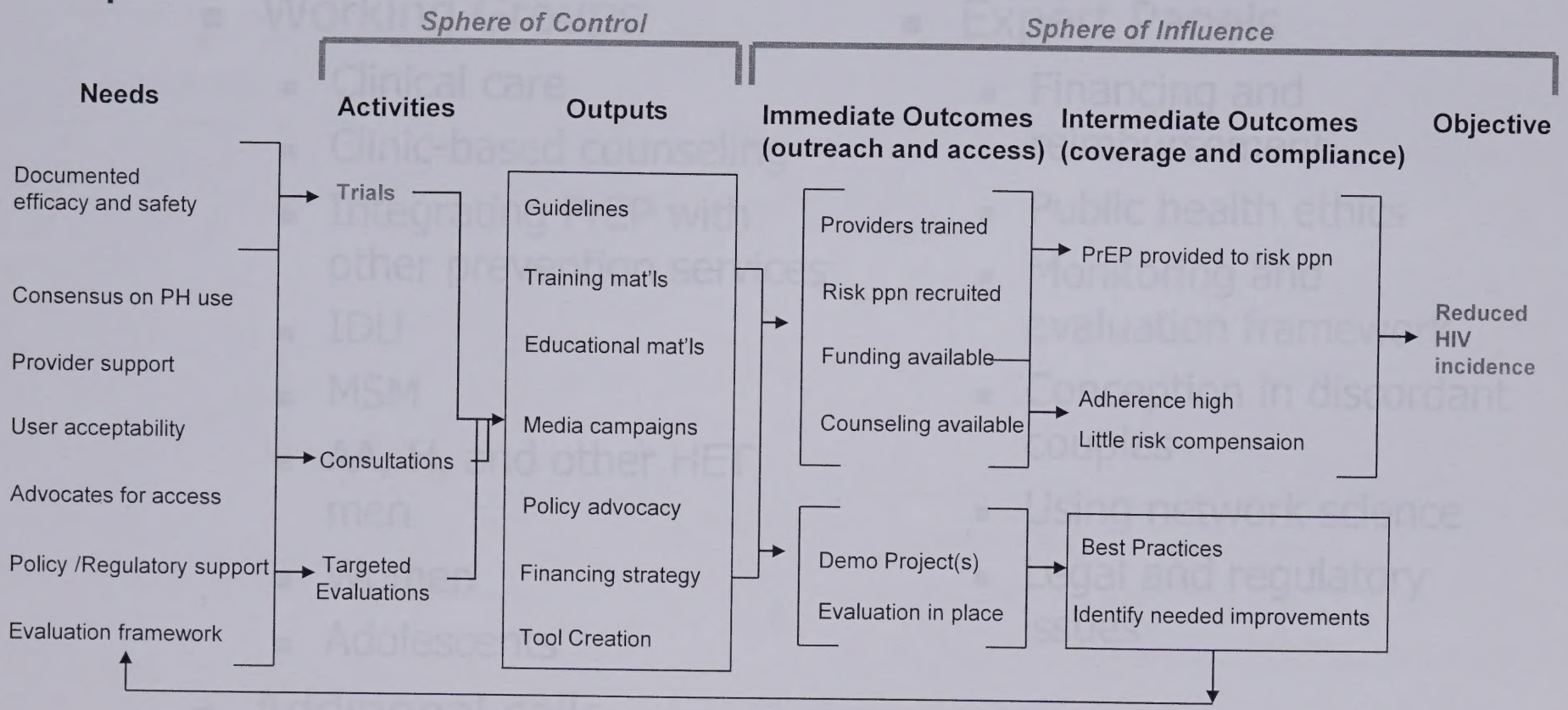
U.S. PrEP Implementation Logic Model



U.S. PrEP Implementation Logic Model

External Input Groups

- Working Groups
  - Clinical care
  - Clinic-based counseling
  - Integrating PrEP with other prevention services
  - IDU
  - MSM
  - AA, H, and other HET men
  - Women
  - Adolescents
- Additional calls
  - Transgender persons

- Expert Panels
  - Financing and reimbursement
  - Public health ethics
  - Monitoring and evaluation framework
  - Conception in discordant couples
  - Using network science
  - Legal and regulatory issues
  - Insurers and Employers

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Resources for more information

- PrEP
  - http://www.cdc.gov/hiv/resources/qa/prep.htm
  - http://www.prepwatch.org

Resources for more information

- PEP
- http://www.cdc.gov/MMWR/preview/mmwrhtml/rr4814a1.htm
- http://www.preparedness.org

Pre-Exposure Prophylaxis (PrEP) for HIV Infection

What is Pre-Exposure Prophylaxis?

Prophylaxis means disease Prevention. Pre-exposure prophylaxis (PrEP) is any medical or public health procedure used before exposure to the disease-causing agent, its purpose is to prevent, rather than treat or cure a disease. An example would be if a doctor gave a medication used to treat a disease to a healthy person who is not thought to have that disease, but is at risk for contracting that disease.

PrEP for the reduction of HIV transmission has immediate implications since tenofovir-emtricitabine (Truvada®) is already FDA approved and available by prescription for the treatment of HIV infection.

Who Should Use PrEP?

In the United States, HIV infection among Gay and Bisexual men is severe (at a rate more than 44 times higher then other men) and risk reduction strategies are urgently needed. Moreover, data suggest that HIV infections have been steadily increasing in this group since the mid-1990s. Therefore, PrEP is being considered as a safe and effective tool to reduce the risk of HIV infection among MSM. PrEP, when combined with other prevention strategies, can reduce HIV risk among men who have sex with men. It has been noted from these studies, that HIV risk can be cut by as much as 92% if the pill is taken every day. Early studies have targeted exclusively MSM. Potential users to be considered include individuals HIV negative with a partner who is HIV Positive; individuals with frequent partner change or concurrency; with partners at high risk of HIV infection (injection drug user, non-monogamous) and other evidence of risk.

Is PEP and PrEP an Option?

Currently PEP is used as an emergency HIV prevention practice. As PEP becomes increasingly available and community awareness expands, discussions are taking place expanding the uses of Truvada as a prevention practice of HIV. Many questions arise from this consideration. Should at risk women use PrEP as a method of prevention? What is the dosage amount? What effect does Truvada have on HIV negative individuals' long term? Does the use of PrEP replace safe sex practices?

PrEP Health Dept. Issues for Consideration.

Early studies released in July 2010 and before suggest no significant safety issues on the part of participants. Data exist from the use of TDF in high concentrations that it can be associated with renal disorders in the treatment of HIV. What are the effects on HIV Negative individuals? If one is being treated with PrEP and later becomes HIV Positive, what effect will that have regarding drug resistance? Preliminary safety trials have not shown resistance in seroconverters. Adherence to PrEP regimen outside of cliental trials is a major factor. Life situations including stable housing, mental health or substance use issues may interfere with adherence to PrEP. Clinical trial participants have a greater support for adherence that may be available in real-life situations. Is PrEP taken daily, every other day, and what is the cost?

Is There a Future for PEP and PrEP?

It is argued that theoretically, pre-exposure prophylaxis could have an enormous impact on the worldwide HIV-1 epidemic. Math models estimate that if Tenofovir PrEP was used by 90% of high-risk people and was effective 90% of the time, the potential spread of HIV infection could be reduced by more than 80% in a few years. Despite these estimates, it is highly unlikely that everybody who could benefit from PrEP would receive antiretroviral drugs. Most of the countries that are facing the full impact of the HIV epidemic do not have the infrastructure or economic resources to implement such a strategy. Projected cost without insurance is approximately $7,100 – $12,000 annually. In some cases, insurance is paying part of the cost.

Final Considerations

Current conclusions indicate PrEP does not replace Safe-Sex practices. Current study results indicate positive results only pertaining to MSM. The Global iPrEx study indicates PrEP reduces the chance of infection by approximately 44%. The AIDS Healthcare Foundation argues "The iPrEx trial results cannot support the use of FTC-TDF as an HIV prevention tool for gay men due to lack of effectiveness, the potential decrease of condom-use, the increased risk of drug resistance and the uncertainty of the effects of PrEP if users have no trial support". The CDC issued a guidance for PrEP uses, "For MSM at high risk for HIV infection, PrEP may represent a much-needed additional prevention tool. However, PrEP should be used only in combination with other HIV prevention strategies, requires strict adherence, and is an intensive approach that won't be right for everyone. There are new studies and trials currently taking place. Until the additional research is completed and analyzed the CDC guidance should be followed. The data from clinical trials will have to be evaluated in terms of clinical efficacy in relation to the entire cost of PrEP delivery to determine the feasibility and cost-effectiveness of PrEP in various communities and settings. Researches also recommend PrEP should be used in conjunction with other prevention options, condom use, routine testing, negotiation with partners and other risk reduction strategies. Current estimate of 44% effectiveness from data from the Global iPrEx study currently is too low of a success rate.

Sources:
www.avert.org
www.webmd.com
www.avac.org
www.nastad.org
www.projectinform.org
Anthony S. Fauci, MD. Director NIAID

Black MSM and Cultural Competency: a look at homophobia and High Risk Sexual Behavior

Presented by: Craig Washington, MSW & Amari Enam, MA

Description: HIV infections continue to increase in the Black MSM population. This breakout session is geared toward any person working with Black MSM in a prevention and treatment capacity. We will focus on high risk sexual behavior, particularly raw or unprotected sex, and social determinants of behavior.

Objectives: 1) Participants will be able to learn three reasons why Black MSM engage in risky sexual behavior; 2) Participants will be able to learn three prevention interventions that are helpful in reducing high risk sexual behavior; 3) Participants will be able to learn about internalized homophobia and its effects on the Black MSM population.

Black MSM are at greater risk for HIV infection than are general populations across much of the African diaspora

- Policies that criminalise homosexuality in the Caribbean are associated with increased prevalence of HIV infection in black MSM

- Regular access to safe and culturally competent HIV care is not available to black MSM across the diaspora

- HIV prevention programmes do not always target black MSM, and investments in HIV prevention in black MSM are underfunded

- Structural interventions to address poverty or reduce discrimination (eg, homophobia, AIDS stigma, racism) in health-care systems and beyond are necessary to decrease the disproportionate prevalence of HIV infection in black MSM

Recommendations

Ensure that resources allocated to targeting of black men who have sex with men (MSM) are proportionate to their role in HIV epidemics
- Remove policies worldwide that exacerbate HIV transmission, stigma, or discrimination in black MSM
- Train law enforcement officials to recognise, interrupt, report, and prosecute attacks against MSM in Caribbean and African countries
- Encourage European, Central American, and South American countries to stratify HIV surveillance data in MSM by race and hold global and regional meetings to share promising research and programmes
- Provide basic access to condoms and water-based lubrication and increase the number of health-care providers and health centres that can provide culturally competent care for black MSM
- Design studies that emphasise protective factors (individual and community strengths) against HIV infection and interventions that mitigate or neutralise structural (eg, anti-gay violence, low income, discrimination) factors associated with HIV transmission risk

Probable Factors

The first factor is the occurrence of STD, as infections of this type facilitate acquisition and transmission of HIV [72,73] and black MSM in our meta-analysis were more likely than white MSM to be diagnosed with a current STDand to have (or have had) gonorrhea, syphilis, or hepatitis B. Although gonorrhea and syphilis are both associated with HIVinfection or transmission, hepatitisBis not. However, hepatitis B is transmitted through HIV risk behavior (i.e., unprotected sex or intravenous drug use), and black MSMacross studies were more likely than white MSMto have hepatitis B in spite of comparable sexual and intravenous drug use behaviors.

The second factor is the high rates of UAI among black MSM early in the HIV/AIDS epidemic. Studies that solely recruited black MSM during the first decade of the epidemic also documented high rates of UAI [12,74], and high HIV prevalence among black gay and bisexual men were already being reported in Centers for Disease Control and prevention (CDC) surveillance data [75] and prospective studies [59] from that time period. Since black MSM tend to have sex with other black partners [18,76], greater rates of UAI early in the epidemic may have increased the background prevalence of HIV among black MSM, which has continued to rise to the disproportionately high HIV rates observed today in spite of comparable rates ofUAI as white MSMsince the 1990s

The third factor is ARTusage. It has been demonstrated that ART use decreases viral load, which lowers HIV infectivity [77]. HIV-positive individuals who are not taking ARTare more likely to transmit HIV to uninfected sex partners during unprotected episodes than are individuals who are taking therapy. However, despite markedly higher HIV prevalence and the widespread availability of ART, we found that HIV-positive black MSM were less likely than HIV-positive white MSM to be taking ART.This is concerning because studies report that black MSM are more likely to be diagnosed later in the progression of HIV infection, when ART is recommended, than white MSM.

Another possible factor for the disproportionately high rates of HIV infection among black MSM is undiagnosed HIV infection [21,43]. Although our meta-analyses showed that black MSM were just as likely as white MSM to report ever being tested for HIV across studies, an additional analysis (not reported in Table 2) found that black MSM were seven times more likely than white MSM to have an unrecognized HIV infection (OR, 7.67;

95% CI, 6.05–9.71; k¼2). High rates of unrecognized HIV infection among black MSM increase the odds of HIV transmission to sexual partners.

Higher prevalence within sex networks

Homophobia and Gender Oppression

- Systemic forms of homophobia on the experiences have an impact on social and sexual behavior.
- Homophobia and gender oppression operates on interpersonal level.
- Homophobia and gender oppression enforced through religious, political, legal, and governmental institutions.

Stigma

- sexual identity
- race, ethnicity, gender identity
- internalized stigma
- stigma surrounding HIV testing
- illness-related stigma
- HIV status *and* the perception of HIV status

There are several limitations in the current study. First, the results in this paper cannot be generalized beyond black MSM and white MSM. It is not known whether the hypotheses examined would show similar effects if we compared black MSMwith other MSMof color. Second, it is important to note that some findings are based on a small set of studies. These should be viewed as preliminary and need to be addressed when more data become available. Third, all of the studies of youngMSMshared the same probability-based recruitment method and themetaanalysis results for young MSM may be a function of the recruitment methodology rather than actual behavioral differences by race. Fourth, there were too few studies to examine by meta-analysis the role of circumcision, genetics, incarceration, social networks, healthcare access, ARTadherence or anorectal douching to disparate rates of HIV infectionamongMSM.These subject areas need to be addressed in subsequent studies and may provide further explanation for high rates of HIV infection among black MSM.

HPTN 061

The study was conducted by the HIV Prevention Trials Network, the largest longitudinal study of Black MSM in the 31 years of the HIV epidemic. The study enrolled 1,553 Black MSM in six U.S. cities: Atlanta, Boston, New York City, Los Angeles, San Francisco and Washington, D.C. In order to qualify, all men had to have reported unprotected anal intercourse with another man within the previous six months.

The results were staggering. Of the participants who thought they were HIV negative or did not know their status when the study started, 12 percent turned out to be positive. Overall, the rate of new HIV infection among Black MSM in the study was 2.8 percent per year and 5.9 percent for those under the age of 30. But other sobering findings show what specific Black gay men were most at risk. Men who had unprotected anal intercourse or were diagnosed with another sexually transmitted infection at the beginning of the study were more likely to be HIV positive. And despite a decade of media hype about men on the "down low," this study supported the findings of other research that men who were gay identified and only had sex with other men were more likely to have HIV than men who had sex both with men and women.

Nearly three percent of all Black gay and bisexual men in America acquire HIV every year, a rate 50 percent higher than their White counterparts, according to a new six-city study released at the 2012 International AIDS Conference. The study, known as HPTN 061, showed some alarming news for the rising rates, particularly among young Black gay and bisexual men. Young Black gay and bisexual men (30 years old and younger) are becoming HIV positive at three times the rate of white gay and bisexual men.

Since many people's sexual identities can be fluid, public health officials often describe gay and bisexual men as men who have sex with men (MSM).

"We have known that Black MSM are affected by HIV at disproportionately higher rates when compared to other MSM in the U.S., but the HPTN 061 HIV incidence rates were extremely high," said Darrell Wheeler, Ph.D., MPH, co-chair of the study and dean of the School of Social Work at Loyola University. "They make it very clear that we must urgently find and implement ways to stem the spread of HIV among Black gay men in this country, and critically among young Black gay men."

The study was conducted by the HIV Prevention Trials Network, the largest longitudinal study of Black MSM in the 31 years of the HIV epidemic. The study enrolled 1,553 Black MSM in six U.S. cities: Atlanta, Boston, New York City, Los Angeles, San Francisco and Washington, D.C. In order to qualify, all men had to have reported unprotected anal intercourse with another man within the previous six months.

The results were staggering. Of the participants who thought they were HIV negative or did not know their status when the study started, 12 percent turned out to be positive. Overall, the rate of new HIV infection among Black MSM in the study was 2.8 percent per year and 5.9 percent for those under the age of 30. But other sobering findings show what specific Black gay men were most at risk. Men who had unprotected anal intercourse or were diagnosed with another sexually transmitted infection at the beginning of the study were more likely to be HIV positive. And despite a decade of media hype about men on the "down low," this study supported the findings of other research that men who were gay identified and only had sex with other men were more likely to have HIV than men who had sex both with men and women.

Researchers have well documented the problem of high HIV infections among Black gay men, but the solutions seem to be elusive. This study found that internalized homophobia (men who feel great social stigma for being gay may be less likely to seek medical care or to practice safer sex), poor education, imprisonment, and poverty were strong drivers of HIV infection.

In addition to social issues likely making Black MSM more vulnerable to HIV infection, some advocates also cite the lack of political will and disparities in funding for prevention efforts. In a newly released report on Black gay men entitled "Back of the Line," the Black AIDS Institute argues: "Notwithstanding the alarming tenor of official reports regarding the epidemic among Black MSM, this health care crisis has failed to elicit an appropriate response. Federal agencies do not currently track resource allocations for Black MSM, although the limited evidence that exists indicates that Black MSM are severely under-prioritized when it comes to HIV-related spending."

Black gay advocates are calling for closer coordination with federal agencies to deal with the multi-layered aspects of the epidemic.

"We look forward to working with the NIH, CDC, Departments of Education and Justice, to conduct further research and to develop effective programs to address issues and traumatic conditions identified in the study, including ostracism, childhood sexual abuse, homelessness, early sexual debut, and persistent unemployment, low literacy and poverty," said Sheldon D. Fields, Ph.D, in a statement from the National Black Gay Men's Advocacy Coalition. Dr. Fields is a member of the research team for the study, and also assistant dean of clinical affairs and health policy at the College of Nursing and Health Sciences at Florida International University.

For years, many black HIV advocates have been calling for greater attention to the domestic AIDS epidemic. The rate of new infections in this study for Black gay men in the U.S. is on par with overall infection rates in many sub-Saharan African countries. But at the International AIDS Conference, this year happening in Washington, D.C., that message may now have international attention.

"The U.S. has shown so much love for people with HIV in the developing world, but let's look at what's happening in the nation's capitol, where people with HIV are mostly poor and Black," said pop music icon

and AIDS philanthropist Elton John. “If the U.S. wanted to end HIV infections at home, it could in a heartbeat."

Explaining disparities in HIV infection among black and white men who have sex with men: a meta-analysis of HIV risk behaviors

Gregorio A. Millett[a], Stephen A. Flores[a], John L. Peterson[b] and Roger Bakeman[b]

Objective: To identify factors that contribute to the racial disparity in HIV prevalence between black and white men who have sex with men (MSM) in the United States.

Methods: A comprehensive literature search of electronic databases, online bibliographies, and publication reference lists yielded 53 quantitative studies of MSM published between 1980 and 2006 that stratified HIV risk behaviors by race. Meta-analyses were performed to compare HIV risks between black and white MSM across studies.

Results: Compared with white MSM, black MSM reported less overall substance use [odds ratio (OR), 0.71; 95% confidence interval (CI), 0.53–0.97], fewer sex partners (OR, 0.64; 95% CI, 0.45–0.92), less gay identity (OR, 0.29; 95% CI, 0.17–0.48), and less disclosure of same sex behavior (OR, 0.42; 95% CI, 0.30–0.60). HIV-positive black MSM were less likely than HIV-positive white MSM to report taking antiretroviral medications (OR, 0.43; 95% CI, 0.30–0.61). Sexually transmitted diseases were significantly greater among black MSM than white MSM (OR, 1.64; 95% CI, 1.07–2.53). There were no statistically significant differences by race in reported unprotected anal intercourse, commercial sex work, sex with a known HIV-positive partner, or HIV testing history.

Conclusions: Behavioral risk factors for HIV infection do not explain elevated HIV rates among black MSM. Continued emphasis on risk behaviors will have only limited impact on the disproportionate rates of HIV infection among black MSM. Future research should focus on the contribution of other factors, such as social networks, to explain racial disparities in HIV infection rates. © 2007 Lippincott Williams & Wilkins

AIDS 2007, **21**:2083–2091

Keywords: black, gay, HIV/AIDS, homosexual, MSM, risk behavior

Introduction

Since the early 1980s, the HIV epidemic in the United States has exacted a severe toll on men who have sex with men (MSM). This HIV burden has most disproportionately impacted black men, who represent an increasingly large percentage of AIDS cases among MSM [1–4]. HIV prevalence and incidence are significantly higher among black MSM than other MSM and rival corresponding rates in the developing world [5–8]. Moreover, HIV prevalence and incidence are considerably higher both in younger (15–22 years) and older (18–49 years) US samples of black MSM than in MSM of all other racial or ethnic groups [9–10].

Explanations remain elusive for the racial disparity in HIV infection between black MSM and other racial/ethnic groups of MSM. Although unprotected anal intercourse (UAI), which is a leading risk factor for HIV infection among MSM [11], has been considered a prime candidate for the disparate rates of HIV infection between black and other MSM [12], several studies have found greater HIV

From the [a]Centers for Disease Control and Prevention, and the [b]Department of Psychology, Georgia State University, Atlanta, Georgia, USA.

Correspondence to G.A. Millett, Centers for Disease Control and Prevention 1600 Clifton Road, Mail Stop E-37 Atlanta, GA 30333, USA.

E-mail: gmillett@cdc.gov

Received: 18 February 2007; revised: 7 June 2007; accepted: 13 June 2007.

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prevalence among black MSM despite comparable or lower rates of UAI than MSM of other races or ethnicities [5,6,13–15].

Recent evidence suggests that racial differences in HIV infection rates among MSM may potentially depend on factors other than behavioral risks. A recently published literature review examined 12 hypotheses (Table 1) for the greater prevalence of HIV among black MSM [16]. The authors of the qualitative review found that black MSM were no more likely than MSM of other races or ethnicities to engage in sexual risk behavior, nor were black MSM more likely than other MSM to report substance use. However, the investigators also found that black MSM were more likely to have had a sexually transmitted disease (STD). In addition, although black MSM were as likely as other MSM to ever be tested for HIV, black MSM tested less frequently and were more likely to have an unrecognized HIV infection than other MSM.

The qualitative nature of the literature review was one of its limitations. Accordingly, the current study extends the earlier review through a quantitative examination of possible explanations for the disparate rates of HIV infection by comparing the risk behaviors of black MSM and white MSM.

Methods

Article sources and selection

The search strategy used several sources for identifying relevant reports, replicating the search strategy described in the qualitative review. Using MEDLINE, ERIC, Sociofile and PsychInfo, articles were identified that had been published from the beginning of online indexing of scientific articles (1974) through December 2006. In addition, HIV-related online bibliographic resources

Table 1. Hypotheses for greater HIV infection rates among black men who have sex with men.

Hypothesis	Factors
1. **Sexual risk.** Black MSM are more likely than other MSM to engage in high-risk sexual behavior	a. Unprotected anal intercourse b. No. sex partners c. Commercial sex work activity
2. **Identity/disclosure.** Black MSM are less likely than other MSM to identify as gay or to disclose their sexual identity, which may lead to increased HIV risk behavior	a. Nongay identity b. Nondisclosure of sexuality c. Nongay identity and HIV risk[a] d. Nondisclosure of sexuality and HIV risk[a]
3. **Substance use.** Black MSM are more likely than other MSM to abuse substances, especially injection drugs, that increase their risk for HIV infection	a. General drug use b. Alcohol use c. Marijuana d. Injection drug use e. Amphetamines f. Cocaine (including crack) g. Needle sharing h. Hallucinogens i. Amyl nitrites ('poppers') j. Opiates[a] k. Drug use during intercourse[a]
4. **STD history.** Black MSM are more likely than other MSM to contract STD that facilitate the acquisition and transmission of HIV	
5. **HIV testing.** Black MSM are less likely than other MSM to be tested for HIV or to know their HIV status, and they may unknowingly expose their sexual partners to HIV	a. HIV testing (ever) b. HIV testing frequency[a] c. Unrecognized HIV infection[a]
6. Black MSM are genetically more susceptible to HIV than other MSM	
7. Black MSM are less likely than other MSM to be circumcised, increasing their risk for HIV infection	
8. **ART use.** HIV-positive black MSM are infectious for a longer time than other HIV-positive MSM	a. Healthcare service access and insurance[a] b. ART use c. Adherence to ART[a]
9. **Sex with HIV-positive partners.** Black MSM are more likely than other MSM to have sex with partners known to be HIV positive.	
10. The sexual networks of black MSM place them at greater risk for HIV infection than the sexual networks of other MSM	
11. Black MSM are more likely than other MSM to be incarcerated, which increases the likelihood of exposure to HIV	
12. Black MSM are more likely than other MSM to engage in anorectal douching, which increases their risk for HIV infection	

MSM, men who have sex with men; UAI, unprotected anal intercourse; STD, sexually transmitted diseases; ART, antiretroviral therapy.
Source: Millett *et al.* [16]; Note that these authors found no support for hypotheses 1–3, support for 4 and 5, and insufficient or inconclusive support for 6–12. The present study addresses hypotheses 1–5, 8, and 9 (bolded).
[a]Denotes subtopics in a hypothesis for which there were insufficient quantitative data (i.e., < 3 effect sizes from unrelated studies) to perform a meta-analysis.

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(specifically, http://www.metrokc.gov/health/apu/new-art/namenu.htm and http://www.medadvocates.org/marg/MSM/main.html), which contained indexed articles dating back to 2000, were searched and the reference lists of pertinent articles were checked for additional citations.

The initial search yielded a total of 1042 citations that referenced blacks and MSM. After eliminating articles that were not written in English, dissertation abstracts, conceptual papers, and review articles, 768 articles remained. Next articles unrelated to HIV or AIDS were eliminated, which reduced the sample to 457 articles. Last, qualitative articles, duplicate references, and articles that were not relevant to our hypotheses were removed, resulting in a sample of 117 articles.

To be included in the meta-analysis, articles needed to (a) be based in the United States, (b) recruit both black and white MSM, (c) be responsive to at least 1 of the 12 hypotheses, and (d) provide quantitative data for MSM stratified by race for an outcome relevant to one of the hypotheses. The comparison in HIV risk data was limited to black MSM and white MSM because data for other ethnic groups are less frequently given and their categorizations vary.

These criteria resulted in the selection of 53 peer-reviewed articles [5,13,14,17–66] for the meta-analyses, which allowed seven hypotheses from the qualitative review to be addressed (Table 1 hypotheses 1–5 and 8–9).

Data abstraction and preparation

Pairs of reviewers independently abstracted data from eligible articles. Abstracted data included the study authors, publication year, overall sample size, sample size of black MSM and white MSM, data collection methods (self-administered or interviewer administered), sampling methodology (random, nonrandom), data collection setting(s), data collection period, relevant hypotheses, types of analysis (univariate, multivariate), and findings. Any disagreements during the abstraction process were resolved by discussion.

Several decision rules guided the preparation of data for analyses.

1. Only data from black MSM and white MSM were used to calculate effect sizes; data from other groups (e.g., women, heterosexuals, Latino MSM or Asian MSM, etc.) in eligible articles were not used.
2. Given a zero cell, 0.5 was added to each cell before computing the odds ratio (OR) [67,68].
3. Articles could contribute *more than one* effect size as data were analyzed separately for each outcome of interest to ensure independence.
4. Multiple effect sizes that addressed *the same* outcome of interest in a given article were aggregated so that each article contributed only one effect size for each outcome of interest.
5. When both univariate and multivariate results were provided, the univariate results were selected for the meta-analyses. Univariate results were more comparable across studies since covariates varied widely across multivariate models.
6. Only the most recent and most generalizable study was selected when there were multiple publications from the same database for a given outcome of interest.

Data synthesis

Abstracted data for black MSM and white MSM were converted into percentages that represented 'yes' versus 'no' responses for a given outcome of interest and placed into a summary table (available on request). For those few outcomes that only reported percentages, means, an F score or t statistic, a standardized mean difference was calculated and then converted into an OR value. Data were aggregated across studies for each outcome of interest to estimate an overall effect size. To estimate the overall effect size, the logarithm of each OR was weighted by the inverse of its variance, and the weighted log values were summed across samples and then divided by the sum of the weights. For the purpose of presenting the results, effect sizes and 95% confidence intervals (CI) were converted back to OR values.

A random-effects model for aggregating individual effect sizes was used because it provided a conservative estimate of the variance and generated more accurate inferences about a population of studies beyond those included in the review [69]. An OR >1 indicated an increased likelihood of an outcome of interest among black MSM compared with white MSM; while an OR <1 indicated a decreased likelihood of a given outcome among black MSM compared with white MSM.

Results

Of the 53 studies, 48 (91%) exclusively recruited MSM, four (8%) recruited men and women, and one (2%) recruited men of various sexual orientations. Most of the studies (68%) recruited participants through nonprobability methods. In addition, although 20 studies (38%) recruited a general sample of MSM from bars, clubs, and community organizations, the remaining studies targeted specific populations including HIV-positive participants (23%), young men [aged 15–29 years (15%)], STD clinic attendees (9%), drug-using men (4%), bisexual men (4%), HIV-negative men (4%), and incarcerated men (3%).

The meta-analysis results for the outcomes of interest are shown in Table 2. There were no significant differences between black MSM and white MSM across studies in reported UAI, commercial sex work activity, substance

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Table 2. Meta-analysis results by hypothesis.

Hypothesis[a]	*k*	Black (No.)	White (No.)	OR[b] (95% CI)
1a. Sexual risk, UAI with male partners	17	3737	15467	1.05 (0.73–1.50)
1b. Sexual risk, No. sex partners	10	2083	11447	0.64 (0.45–0.92)*
1c. Sexual risk, commercial sex work	6	1456	2047	1.45 (0.85–2.47)
2a. Gay identity	9	2684	4172	0.29 (0.17–0.48)*
2b. Disclosure of homosexuality	7	2078	5048	0.42 (0.30–0.60)*
3a. Substance use, general[c]	5	2754	10560	0.76 (0.40–1.45)
3b. Substance use, alcohol	3	141	1075	0.79 (0.33–1.88)
3c. Substance use, marijuana	3	2741	5364	1.16 (0.42–3.20)
3d. Substance use, injection drugs	7	14270	55265	0.95 (0.51–1.76)
3e. Substance use, amphetamines	5	3778	7086	0.47 (0.18–1.22)
3f. Substance use, cocaine (including crack)	6	3863	7002	1.30 (0.52–3.24)
3g. Substance use, needle sharing	3	1037	6406	0.42 (0.10–1.70)
3h. Substance use, hallucinogens	3	2898	5597	0.88 (0.24–3.26)
3i. Substance use, amyl nitrites ('poppers')	4	3796	6889	0.32 (0.12–0.85)*
4. STD, current or lifetime	11	1537	7552	1.64 (1.07–2.53)*
5a. HIV testing, lifetime	4	2098	5119	0.66 (0.34–1.30)
8b. Antiretroviral therapy use	3	272	902	0.43 (0.30–0.61)*
9. Sex with 'known' HIV-positive partners	4	1288	10260	0.77 (0.34–1.74)

OR, odds ratio; CI, confidence interval; UAI, unprotected anal intercourse; *k*, number of effect sizes; STD, sexually transmitted diseases.
[a]Hypothesis numbers are those used in Table 1, from Millett *et al.* [16].
[b]Odds ratios > 1 indicate a greater likelihood of an outcome among black MSM than white MSM.
[c]General substance use includes abstracted data that did not delineate between specific drugs for analyses, or identified specific drugs but grouped them together in analyses.
*$P < .05$.

use by drug (except amyl nitrites), history of HIV testing, or sex with known HIV-positive partners. However, black MSM reported significantly fewer sex partners across studies than white MSM and were less likely than whites to identity as gay or to disclose their homosexuality to others. Among HIV-positive MSM, black MSM were less likely than white MSM to report taking antiretroviral therapy (ART). The only outcome of interest that was significantly greater among black MSM than white MSM was the occurrence of STD.

Stratified analyses

Several stratified analyses were performed to determine whether overall effects differed among subgroups of studies. For 17 studies addressing UAI, the effect sizes were recategorized based upon reporting timeframe, date of publication, and sample characteristics. There were no differences by race among MSM who reported UAI in the past year (OR, 1.12; 95% CI, 0.44–2.81; $k = 3$), past 6 months (OR, 0.89; 95% CI, 0.56–1.39; $k = 5$), past 3 months (OR, 1.75; 95% CI, 0.84–3.67; $k = 2$), or last sexual encounter (OR, 1.97; 95% CI, 0.28–14.05; $k = 2$). When the results were stratified by publication date, there were significantly higher rates of UAI among black MSM compared with white MSM (OR, 1.60; 95% CI, 1.38–1.86; $k = 3$) for studies published during the first decade of the epidemic (1981–1990). However, black MSM and white MSM reported comparable rates of UAI among studies published in the second (1991–2000) and third (2001–2006) decades of the epidemic (OR, 1.09; 95% CI, 0.62–1.93; $k = 3$ and OR, 0.92; 95% CI, 0.61–1.40; $k = 11$, respectively). There were also greater rates of UAI among black MSM for studies published before the availability of HAART (OR, 1.44; 95% CI, 1.11–1.87; $k = 4$) and comparable rates of UAI for studies published after HAART was introduced (OR, 0.95; 95% CI, 0.64–1.39; $k = 13$). There were no differences by race in receptive UAI (OR, 1.03; 95% CI, 0.55–1.93; $k = 5$). There were also comparable rates of UAI by race in studies that recruited a general sample of MSM (OR, 1.06; 95% CI, 0.59–1.91; $k = 8$), but young black MSM were significantly less likely than young white MSM to report engaging in UAI (OR, 0.66; 95% CI, 0.57–0.77; $k = 4$).

No differences by racial group were found when all illicit drugs were recategorized into 'recreational drugs' (marijuana, nitrites, and hallucinogens; OR, 0.60; 95% CI, 0.32–1.12; $k = 10$) or 'hard drugs' (crack/cocaine, injection drugs, amphetamines and opiates; OR, 0.82; 95% CI, 0.52–1.28; $k = 20$). However, black MSM were significantly less likely than white MSM (OR, 0.64; 95% CI, 0.43–0.94; $k = 27$) to use drugs associated with HIV infection (i.e., nitrites, injection drugs, crack/cocaine, opiates, and amphetamines). Given that most OR values for individual drugs and those for recreational and hard drugs suggested greater use by whites, all drugs were grouped together (Fig. 1). Blacks were significantly less likely than whites to report any substance use across studies (OR, 0.71; 95% CI, 0.53–0.97; $k = 41$). When stratified by reporting period, there were comparable rates of substance use in the past 3 months (OR, 1.02; 95% CI, 0.54–1.93; $k = 8$), past 6 months (OR, 0.67; 95% CI, 0.31–1.41; $k = 10$), past year (OR, 1.45; 95% CI, 0.50–4.19; $k = 5$), and past 5 years (OR, 0.87; 95% CI, 0.53–1.42; $k = 7$), but black MSM were significantly less likely than white MSM to report any substance use during their lifetime (OR, 0.34; 95% CI, 0.16–0.74;

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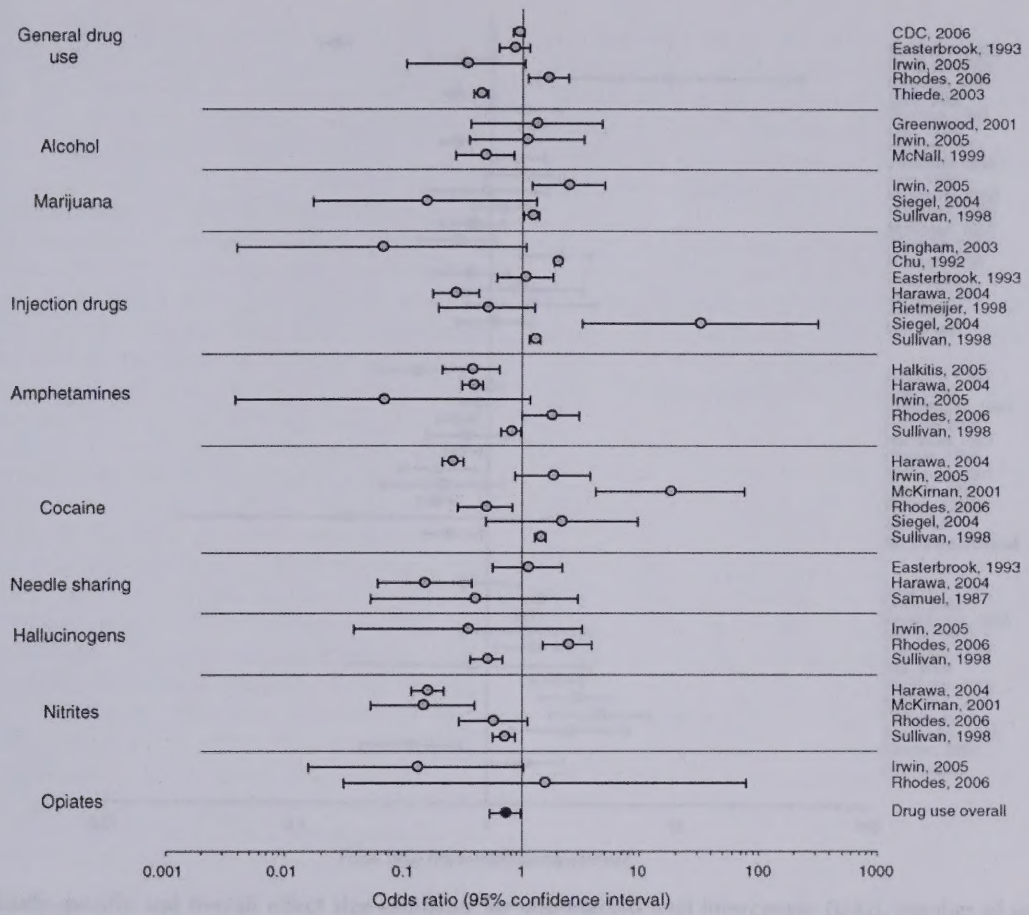

Fig. 1. Study specific and overall effect size estimates for substance use in comparative studies of black and white men who have sex with men (MSM). General drug use includes abstracted data that did not delineate between specific drugs for analyses, or identified specific drugs but grouped them together in analyses. Odds ratios > 1 indicate a greater likelihood of an outcome among black MSM than white MSM. Bars indicate the 95% confidence intervals. Reference sources given by first author and year only.

$k = 8$). Last, no differences were found in substance use by race for studies that recruited a general sample of MSM (OR, 0.96; 95% CI, 0.65–1.43; $k = 12$), HIV-positive MSM (OR, 1.12; 95% CI, 0.72–1.75; $k = 10$) or drug-using MSM (OR, 0.73; 95% CI, 0.32–1.66; $k = 10$); however, young black MSM were significantly less likely than young white MSM to report any substance use (OR, 0.25; 95% CI, 0.15–0.41; $k = 8$).

Reports of STD were recategorized as either 'lifetime' infections (based upon self-report) or 'current' infections (based upon laboratory tests). There were no statistically significant differences among MSM by race in reported lifetime STD infections (OR, 1.29; 95% CI, 0.63–2.66; $k = 5$). However, across studies, black MSM were 2.12 times more likely to be diagnosed with a current STD than white MSM (95% CI, 1.68–2.67; $k = 5$). The results remained consistent with the overall findings when studies were stratified by type of STD: Black MSM were significantly more likely than white MSM to report ever having had or to be currently diagnosed with gonorrhea (OR, 1.53; 95% CI, 1.25–1.87; $k = 4$), syphilis (OR, 2.14; 95% CI, 1.70–2.69; $k = 4$), or hepatitis B (OR, 2.48; 95% CI, 1.27–4.86; $k = 4$).

Discussion

Individual risk behaviors do not appear to be driving the disparity in HIV/AIDS among black MSM (Fig. 2). Despite comparable rates of UAI and fewer sex partners, STD prevalence and HIV prevalence remained greater among black MSM than white MSM. Moreover, black MSM were significantly less likely than white MSM to report engaging in any substance use irrespective of drug type (Fig. 1), and significantly less likely to report using any drugs associated with HIV infection.

Previous studies have reported that nongay-identified or nondisclosing MSM have fewer male sex partners than gay-identified or 'out' MSM [22,54,70]. It is possible that

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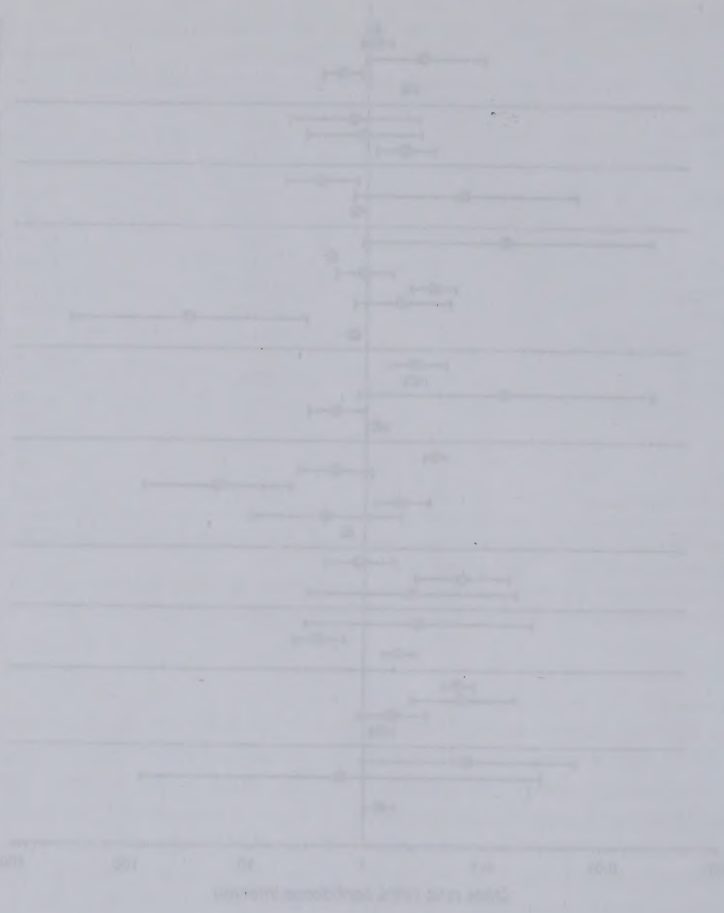

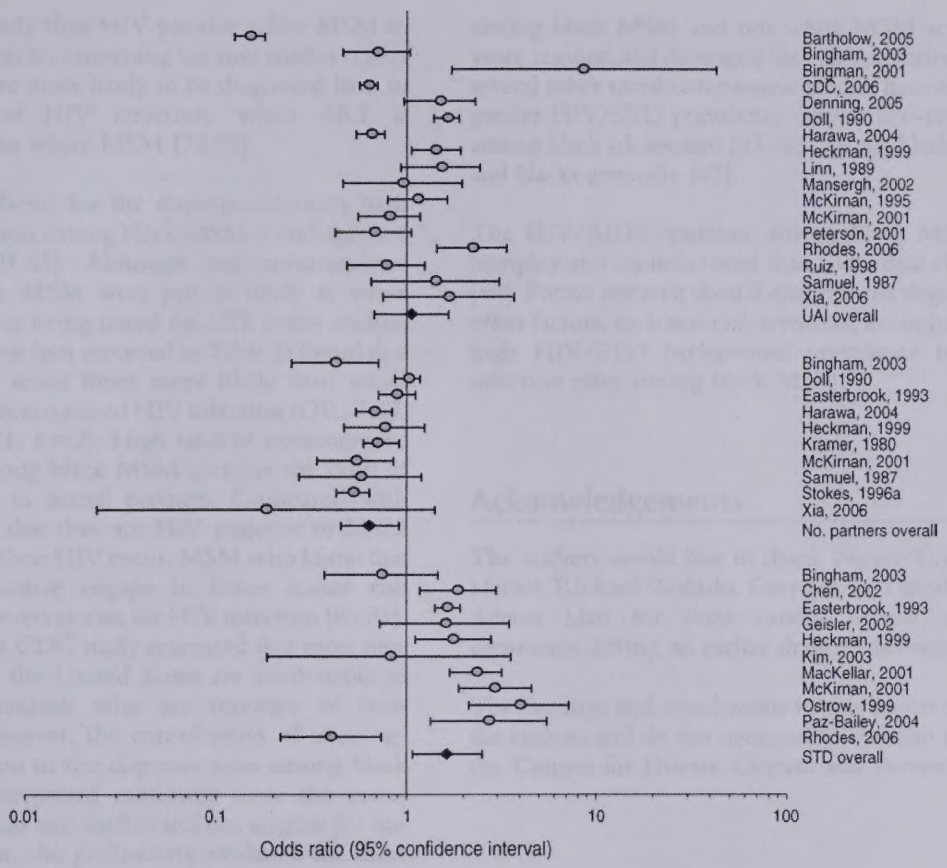

Fig. 2. Study-specific and overall effect size estimates for unprotected anal intercourse (UAI), number of sex partners, and sexually transmitted disease history in comparative studies of black and white men who have sex with men (MSM). Odds ratios >1 indicate a greater likelihood of an outcome among black MSM than white MSM. Bars indicate the 95% confidence intervals. Reference sources given by first author and year only.

black MSM have fewer sex partners across studies than white MSM because black MSM overall are less likely than white MSM to identify as gay or to disclose their sexual behavior [71]. However, having fewer sex partners, being nongay-identified and nondisclosure of sexuality are also each associated with a lower likelihood of HIV infection [7,22,70]; yet HIV infection rates remain greater among black MSM than white MSM.

Our meta-analyses suggest several factors that may be contributing to the high HIV infection rates among black MSM. The first factor is the occurrence of STD, as infections of this type facilitate acquisition and transmission of HIV [72,73] and black MSM in our meta-analysis were more likely than white MSM to be diagnosed with a current STD and to have (or have had) gonorrhea, syphilis, or hepatitis B. Although gonorrhea and syphilis are both associated with HIV infection or transmission, hepatitis B is not. However, hepatitis B is transmitted through HIV risk behavior (i.e., unprotected sex or intravenous drug use), and black MSM across studies were more likely than white MSM to have hepatitis B in spite of comparable sexual and intravenous drug use behaviors.

The second factor is the high rates of UAI among black MSM early in the HIV/AIDS epidemic. Studies that solely recruited black MSM during the first decade of the epidemic also documented high rates of UAI [12,74], and high HIV prevalence among black gay and bisexual men were already being reported in Centers for Disease Control and prevention (CDC) surveillance data [75] and prospective studies [59] from that time period. Since black MSM tend to have sex with other black partners [18,76], greater rates of UAI early in the epidemic may have increased the background prevalence of HIV among black MSM, which has continued to rise to the disproportionately high HIV rates observed today in spite of comparable rates of UAI as white MSM since the 1990s.

The third factor is ART usage. It has been demonstrated that ART use decreases viral load, which lowers HIV infectivity [77]. HIV-positive individuals who are not taking ART are more likely to transmit HIV to uninfected sex partners during unprotected episodes than are individuals who are taking therapy. However, despite markedly higher HIV prevalence and the widespread availability of ART, we found that HIV-positive black

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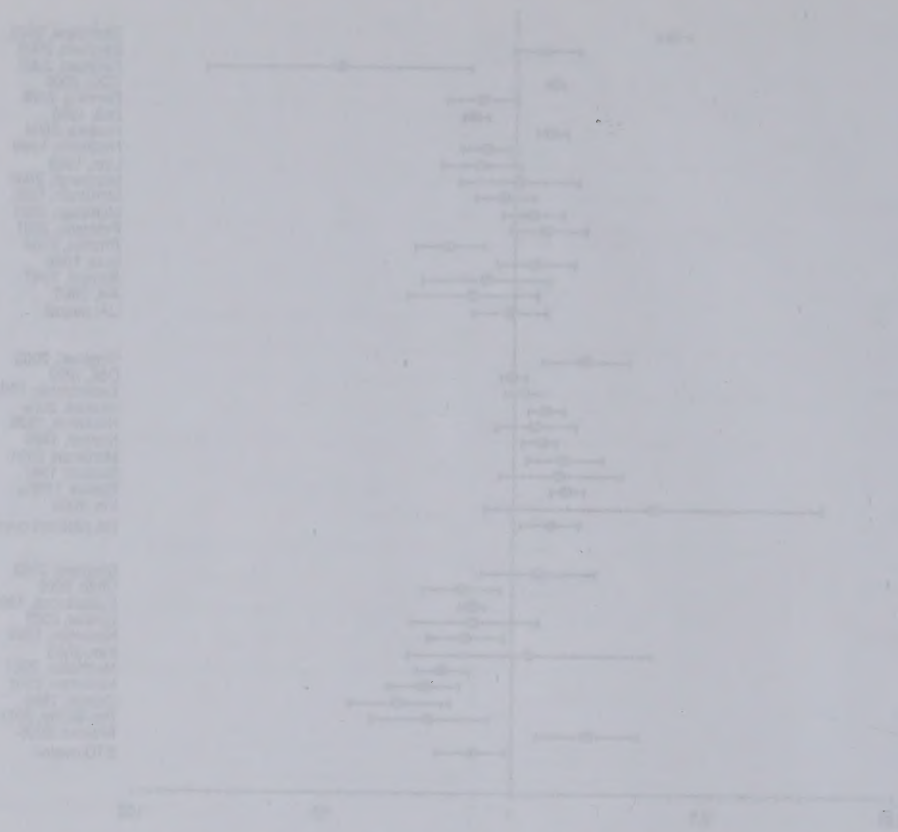

MSM were less likely than HIV-positive white MSM to be taking ART. This is concerning because studies report that black MSM are more likely to be diagnosed later in the progression of HIV infection, when ART is recommended, than white MSM [78,79].

Another possible factor for the disproportionately high rates of HIV infection among black MSM is undiagnosed HIV infection [21,43]. Although our meta-analyses showed that black MSM were just as likely as white MSM to report ever being tested for HIV across studies, an additional analysis (not reported in Table 2) found that black MSM were seven times more likely than white MSM to have an unrecognized HIV infection (OR, 7.67; 95% CI, 6.05–9.71; $k=2$). High rates of unrecognized HIV infection among black MSM increase the odds of HIV transmission to sexual partners. Compared with MSM who know that they are HIV negative or MSM who do not know their HIV status, MSM who know that they are HIV positive engage in fewer sexual risk behaviors with partners at-risk for HIV infection [80,81]. Moreover, a recent CDC study estimated that most new HIV infections in the United States are attributable to HIV-positive individuals who are unaware of their infection [82]. However, the contribution of unrecognized HIV infection to the disparate rates among black MSM must be interpreted cautiously since the meta-analysis was based on two studies and not eligible for our study. Nevertheless, the preliminary evidence for these data are strong given the large overall sample size in the analysis (1293 black and 2545 white), the similar direction of the outcome for each of the two studies, and the large overall effect size.

There are several limitations in the current study. First, the results in this paper cannot be generalized beyond black MSM and white MSM. It is not known whether the hypotheses examined would show similar effects if we compared black MSM with other MSM of color. Second, it is important to note that some findings are based on a small set of studies. These should be viewed as preliminary and need to be addressed when more data become available. Third, all of the studies of young MSM shared the same probability-based recruitment method and the meta-analysis results for young MSM may be a function of the recruitment methodology rather than actual behavioral differences by race. Fourth, there were too few studies to examine by meta-analysis the role of circumcision, genetics, incarceration, social networks, healthcare access, ART adherence or anorectal douching to disparate rates of HIV infection among MSM. These subject areas need to be addressed in subsequent studies and may provide further explanation for high rates of HIV infection among black MSM. Fifth, meta-analyses are subject to the biases of the selected studies and this must be considered in the interpretation of the results. Last, there is a possibility that our results reflect underreporting among black MSM. However, it is unlikely that reporting bias was evident only among black MSM and not white MSM across studies, years, regions, and demographic characteristics. Moreover, several other racial comparative studies have also reported greater HIV/STD prevalence despite low-risk behaviors among black adolescents [83–85], young black adults [86], and blacks generally [87].

The HIV/AIDS epidemic among black MSM is more complex and multifactorial than individual risk behavior [88]. Future research should examine the degree to which other factors, such as social networks, in conjunction with high HIV/STD background prevalence impact HIV infection rates among black MSM.

Acknowledgements

The authors would like to thank Nicole Crepaz, Jeffrey Herbst, Richard Wolitski, Gary Marks, David Purcell and Adrian Liau for their careful review and helpful comments during an earlier draft of this manuscript.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

References

1. Blair JM, Fleming PL, Karon JM. **Trends in AIDS incidence and survival among racial/ethnic minority men who have sex with men, United States, 1990–1999.** *J Acquir Immune Defic Syndr* 2002; **31**:339–347.
2. Centers for Disease Control and Prevention. **HIV/AIDS among racial/ethnic minority men who have sex with men–United States, 1989–1998.** *MMWR Morb Mortal Wkly Rep* 2001; **49**: 4–11.
3. Centers for Disease Control and Prevention. **Cases of HIV infection and AIDS in the United States, by race/ethnicity, 1998–2002.** *HIV/AIDS Surv Rep* 2004; **10**:1–38.
4. Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report, 2003*, Vol. 15. Atlanta, GA: Centers for Disease Control and Prevention; 2004. pp. 34–35.
5. Easterbrook PJ, Chmiel JS, Hoover DR, Saah AJ, Kaslow RA, Kingsley LA, Detels R. **Racial and ethnic differences in human immunodeficiency virus type 1 (HIV-) seroprevalence among homosexual and bisexual men.** *Am J Epidemiol* 1993; **138**:415–429.
6. Lemp G, Hirozawa AM, Givertz D, Nieri GN, Anderson L, Lindegren ML, *et al.* **Seroprevalence of HIV and risk behaviors among young homosexual and bisexual men: The San Franciso/ Berkeley Young Men's Survey.** *JAMA* 1994; **272**:449–454.
7. Valleroy LA, MacKellar DA, Karon JM, Rosen D, McFarland W, Shehan DA, *et al.* **HIV prevalence and associated risks in young men who have sex with men.** *JAMA* 2000; **284**:198–204.
8. Torian LV, Makki HA, Menzies IB, Murrill CS, Weisfuse IB. **HIV infection in men who have sex with men, New York city Department of Health sexually transmitted disease clinics, 1990–1999: a decade of serosurveillance finds that racial disparities and associations between HIV and gonorrhea persist.** *Sex Transm Dis* 2002; **31**:339–347.
9. Centers for Disease Control and Prevention. **HIV incidence among young men who have sex with men- seven US cities, 1994–2000.** *MMWR Morb Mortal Wkly Rep* 2001; **50**:440–444.

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10. Centers for Disease Control and Prevention. **Percentage of persons aged 18–49 years with HIV infection, by age group and race/ethnicity: United States 1999–2002.** *MMWR Morb Mortal Wkly Rep* 2006; **55**:605–609.
11. Vittinghoff E, Douglas J, Judson F, McKirnan D, MacQueen K, Buchbinder S. **Per-contact risk of HIV transmission between male sexual partners.** *Am J Epidemiol* 1999; **150**:306–311.
12. Reid A. Many gay blacks say they shun 'safe sex'. *Boston Globe* June 4, 1990. p. 15.
13. Harawa NT, Greenland S, Bingham TA, Johnson DF, Cochran SD, Cunningham WE, *et al.* **Associations of race/ethnicity with HIV prevalence and HIV-related behaviors among young men who have sex with men in 7 urban centers in the United States.** *J Acquir Immune Defic Syndr* 2004; **35**:526–536.
14. Ruiz J, Facer M, Sun RK. **Risk factors for human immunodeficiency virus infection and unprotected anal intercourse among young men who have sex with men.** *Sex Trans Dis* 1998; **25**: 100–107.
15. Koblin BA, Husnik MJ, Colfax G, Huang Y, Madison M, Mayer K, *et al.* **Risk factors for HIV infection among men who have sex with men.** *AIDS* 2006; **20**:731–739.
16. Millett GA, Peterson JL, Wolitski R, Stall R. **Greater risk for HIV infection of black men who have sex with men. A critical literature review.** *Am J Public Health* 2006; **96**:1007–1019.
17. Bartholow BN, Buchbinder S, Celum C, Goli V, Koblin B, Para M, *et al.* **HIV sexual risk behavior over 36 months of follow-up in the world's first HIV vaccine efficacy trial.** *J Acquir Immune Defic Syndr* 2005; **39**:90–101.
18. Bingham TA, Harawa NT, Johnson DF, Secura GM, MacKellar DA, Valleroy L. **The effect of partner characteristics on HIV infection among African American men who have sex with men in the Young Men's Survey, Los Angeles, 1999–2000.** *AIDS Educ Prev* 2003; **15**:39–52.
19. Bingman CR, Marks G, Crepaz N. **Attributions about one's HIV infection and unsafe sex in seropositive men who have sex with men.** *AIDS Behav* 2001; **5**:283–289.
20. Centers for Disease Control and Prevention. **Human immunodeficiency virus (HIV) Risk, prevention, and testing behaviors – United States, National HIV Behavioral Surveillance System: Men Who Have Sex with Men, November 2003–April 2005.** *MMWR Morb Mortal Wkly Rep* 2006; **54**:597–601.
21. Centers for Disease Control and Prevention. **HIVprevalence, unrecognized infection, and HIV testing among men who have sex with men (MSM): five US cities, June 2004–April 2005.** *MMWR Morb Mortal Wkly Rep* 2005; **54**:597–601.
22. Centers for Disease Control and Prevention. **HIV/STD risks in young men who have sex with men who do not disclose their sexual orientation: six US cities,1994–2000.** *MMWR Morb Mortal Wkly Rep* 2003; **52**:81–85.
23. Chen JL, Callahan DB, Kerndt PR. **Syphilis control among incarcerated men who have sex with men: Public health response to an outbreak.** *Am J PublicHealth* 2002; **92**:1473–1475.
24. Chu SY, Peterman TA, Doll LS, Buehler JW, Curran JW. **AIDS in bisexual men in the United States: epidemiology and transmission to women.** *Am J PublicHealth* 1992; **82**:220–224.
25. Denning PH, Campsmith ML. **Unprotected anal intercourse among HIV-positive men who have a steady male sex partner with negative or unknown HIV serostatus.** *Am J Public Health* 2005; **95**:152–158.
26. Doll LS, Judson FN, Ostrow DG, O'Malley PM, Darrow WW, Hadler SC, *et al.* **Sexual behavior before AIDS: the hepatitis B studies of homosexual and bisexual men.** *AIDS* 1990; **4**:1067–1073.
27. Doll LS, Petersen LR, White CR, Johnson ES, Ward JW. **Homosexually and nonhomosexually identified men who have sex with men: a behavioral comparison.** *J Sex Res* 1992; **29**:1–14.
28. Geisler WM, Whittington WLH, Suchland RJ, Stamm WE. **Epidemiology of anorectal chlamydial and gonococcal infections among men who have sex with men in Seattle: utilizing serovar and auxotype strain typing.** *Sex Transm Dis* 2002; **29**:189–195.
29. Goldbaum G, Perdue T, Wolitski R, Rietmeijer C, Hedrich A, Wood R, *et al.* **Differences in risk behavior and sources of AIDS information among gay, bisexual, and straight-identified men who have sex with men.** *AIDS Behav* 1998; **2**:13–21.
30. Grov C, Bimbi DS, Nanin JE, Parsons JT. **Race, ethnicity, gender and generational factors associated with the coming-out process among gay, lesbian, and bisexual individuals.** *J Sex Res* 2006; **43**:115–121.
31. Greenwood GL, White EW, Page-Shafer K, Bein E, Osmond DH, Paul J, *et al.* **Correlates of heavy substance use among young gay and bisexual men: the San Francisco Young Men's Health Study.** *Drug Alcohol Depend* 2001; **61**:105–112.
32. Halkitis PN, Parsons JT, Wolitski RJ, Remien RH. **Characteristics of HIV antiretroviral treatments, access and adherence in an ethnically diverse sample of men who have sex with men.** *AIDS Care* 2003; **15**:89–102.
33. Halkitis PN, Green KA, Mourgues P. **Longitudinal investigation of methamphetamine use among gay and bisexual men in New York City: findings from Project BUMPS.** *J Urban Health* 2005; **82 (suppl 1)**:i18–i25.
34. Halkitis PN, Zade DD, Shrem M, Marmor M. **Beliefs about HIV noninfection and risky sexual behavior among MSM.** *AIDS Ed Prev* 2004; **16**:448–458.
35. Heckman TG, Kelly JA, Bogart LM, Kalichman SC, Rompa DJ. **HIV risk differences between African-American and white men who have sex with men.** *J Natl Med Assoc* 1999; **91**:92–100.
36. Irwin TW, Morgenstern J. **Drug-use patterns among men who have sex with men presenting for alcohol treatment: differences in ethnic and sexual identity.** *J Urban Health* 2005; **82 (suppl 1)**:i127–i133.
37. Jacobson LP, Gore ME, Strathdee SA, Phair JP, Riddler S, Detels R. **Therapy naivete in the era of potent antiretroviral therapy.** *J Clin Epidemiol* 2001; **54**:149–156.
38. Kass N, Flynn C, Jacobson L, Chmiel JS, Bing EG. **Effect of race on insurance coverage and health service use for HIV-infected gay men.** *J Acquir Immune Defic Syndr Human Retroviruses* 1999; **20**:85–92.
39. Kennamer JD, Honnold J, Bradford J, Hendricks M. **Differences in disclosure of sexuality among African American and White gay/bisexual men: implications for HIV/AIDS prevention.** *AIDS Educ Prev* 2000; **12**:519–531.
40. Kim AA, Kent CK, Klausner JD. **Risk factors for rectal gonococcal infection amidst resurgence in HIVtransmission.** *Sex Transm Dis* 2003; **30**:813–817.
41. Kramer MA, Aral SO, Curran JW. **Self-reported behavior patterns of patients attending a sexually transmitted disease clinic.** *Am J Public Health* 1980; **70**:997–1000.
42. Linn LS, Spiegel JS, Mathews WC, Leake B, Lien R, Brooks S. **Recent sexual behaviors among homosexual men seeking primary medical care.** *Arch Intern Med* 1989; **149**:2685–2690.
43. MacKellar DA, Valleroy LA, Secura GM, Behel S, Bingham T, Celentano DD, *et al.* **Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men.** *J Acquir Immune Defic Syndr* 2005; **38**:603–614.
44. Mackellar DA, Valleroy LA, Secura GM, McFarland W, Shehan D, Ford W, *et al.* **Two decades after vaccine license: hepatitis B immunization and infection among young men who have sex with men.** *Am J Public Health* 2001; **91**:965–971.
45. Mansergh G, Marks G, Colfax GN, Guzman R, Rader M, Buchbinder S. **"Barebacking" in a diverse sample of men who have sex with men.** *AIDS* 2002; **14**:653–659.
46. Mason HR, Simoni JM, Marks G, Johnson CJ, Richardson JL. **Missed opportunities? Disclosure of HIVinfection and support seeking among HIV+ African-American and European-American men.** *AIDS Behav* 1997; **1**:155–162.
47. McKirnan D, Houston E, Tolou-Shams M. **Is the web the culprit? Cognitive escape and internet sexual risk among gay and bisexual men.** *AIDS Behav* 2007; **11**:151–160.
48. McKirnan D, Stokes J, Doll L, Burzette R. **Bisexually active men: social characteristics and sexual behavior.** *J Sex Res* 1995; **32**:65–76.
49. McKirnan DJ, Vanable PA, Ostrow DG, Hope B. **Expectancies of sexual "escape" and sexual risk among drug and alcohol-involved gay and bisexual men.** *J Subst Abuse* 2001; **13**:137–154.
50. McNall M, Remafedi G. **Relationship of amphetamine and other substance use to unprotected intercourse among young men who have sex with men.** *Arch Pediatr Adolesc Med* 1999; **153**:137–154.
51. Montgomery JP, Mokotoff ED, Gentry AC, Blair JM. **The extent of bisexual behaviour in HIV-infected men and implications for transmission to their female sex partners.** *AIDS Care* 2003; **15**:829–837.

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52. Newman PA, Rhodes F, Weiss RE. **Correlates of sex trading among drug-using men who have sex with men.** *Am J Public Health* 2004; **94**:1998–2003.
53. Ostrow DG, Vanable PA, McKirnan DJ, Brown L. **Hepatitis and HIV risk among drug-using men who have sex with men: demonstration of Hart's law of inverse access and application to HIV.** *J Gay Lesbian Med Assoc* 1999; **3**:127–136.
54. Pathela P, Hajat A, Schillinger J, Black S, Sell R, Mostashari F. **Discordance between sexual behavior and self-reported sexual identity: a population-based survey of New York City men.** *Ann Intern Med* 2006; **145**:416–426.
55. Paz-Bailey G, Meyers A, Black S, Brown J, Rubin S, Braxton J, *et al.* **A case-control study of syphilis among men who have sex with men in New York City: association with HIV Infection.** *Sex Transm Dis* 2004; **31**:581–587.
56. Peterson JL, Bakeman R, Stokes J, Community Intervention Trial for Youth Study Team. **Racial/ethnic patterns of HIV sexual risk behaviors among young men who have sex with men.** *J Gay Lesbian Med Assoc* 2001; **5**:155–162.
57. Rhodes SD, Yee LJ, Hergenrather KC. **A community-based rapid assessment of HIV behavioural risk disparities within a large sample of gay men in southeaster USA: A comparison of African American.** *AIDS Care* 2006; **18**:1018–1024.
58. Rietmeijer CA, Wolitski RJ, Fishbein M, Corby NH, Cohn DL. **Sex hustling, injection drug use, and nongay identification by men who have sex with men: associations with high-risk sexual behaviors and condom use.** *Sex Transm Dis* 1998; **25**:353–360.
59. Samuel M, Winkelstein W Jr. **Prevalence of human immunodeficiency virus infection in ethnic minority homosexual/bisexual men.** *JAMA* 1987; **257**:1901–1902.
60. Siegel K, Scrimshaw EW, Karus D. **Racial disparities in sexual risk behaviors and drug use among older gay/bisexual and heterosexual men living with HIV/AIDS.** *J Natl Med Assoc* 2004; **96**:215–223.
61. Simoni JM, Mason HR, Marks G. **Disclosing HIV status and sexual orientation to employers.** *AIDS Care* 1997; **9**:589–599.
62. Stokes JP, McKirnan DJ, Doll L, Burzette RG. **Female partners of bisexual men: what they don't know might hurt them.** *Psychol Women Q* 1996; **20**:267–284.
63. Stokes JP, Vanable PA, McKirnan DJ. **Ethnic differences in sexual behavior, condom use, and psychosocial variables among black and white men who have sex with men.** *J Sex Res* 1996; **33**:373–381.
64. Sullivan PS, Nakashima AK, Purcell DW, Ward JW. **Geographic differences in noninjection and injection substance use among HIV-seropositive men who have sex with men: western United States versus other regions.** *J Acquir Immune Defic Syndr Hum Retrovirol* 1998; **19**:266–273.
65. Thiede H, Valleroy LA, MacKellar DA, Celentano DD, Ford WL, Hagan H, *et al.* **Regional patterns of correlates of substance use among young men who have ex with men in 7 US urban areas.** *Am J Pub Health* 2003; **93**:1915–1921.
66. Xia Q, Osmond DH, Tholandi M, Pollack LM, Zhou W, Ruiz JD, *et al.* **HIV prevalence and sexual risk behaviors among men who have sex with men: results from a statewide population-based survey in California.** *J Acquir Immune Defic Syndr* 2006; **41**:238–245.
67. Cooper H, Hedges LV. *The Handbook of Research Synthesis.* New York: Russell Sage Foundation; 1994.
68. Wickens TD. *Multiway contingency tables analysis for the social sciences.* Hillsdale, NJ: Erlbaum; 1989.
69. Hedges LV, Vevea JL. **Fixed and random effects models in meta-analysis.** *Psychol Meth* 1998; **3**:486–504.
70. Wood RW, Krueger LE, Pearlman TC, Goldbaum G. **HIV transmission: women's risk from bisexual men.** *Am J Pub Health* 1993; **83**:1757–1759.
71. Millett G, Malebranche D, Mason B, Spikes P. **Focusing "down low": bisexual black men. HIV risk and heterosexual transmission.** *J Natl Med Assoc* 2005; **97**:52S–59S.
72. Fleming DT, Wasserheit JN. **From epidemiological synergy to public health policy: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection.** *Sex Transm Infect* 1999; **75**:3–17.
73. Rothenberg RB, Wasserheit JN, St Louis ME, Douglas JM. **The effect of treating sexually transmitted diseases on the transmission of HIV in dually infected persons: a clinic-based estimate.** *Sex Transm Dis* 2000; **27**:411–416.
74. Peterson JL, Coates TJ, Catania JA, Middleton L, Hilliard B, Hearst N. **High-risk sexual behavior and condom use among gay and bisexual African-American men.** *Am J Public Health* 1992; **82**:1490–1494.
75. Bakeman R, Lumb JR, Jackson RE, Smith DW. **AIDS risk-group profiles in whites and members of minority groups.** *N Engl J Med* 1986; **315**:191–192.
76. Centers for Disease Control and Prevention. **HIV transmission among black college student and nonstudent men who have sex with men–North Carolina, 2003.** *MMWR Morb Mortal Wkly Rep* 2004; **53**: 731–734.
77. Porco TC, Martin JN, Page-Shafer KA, Charlebois E, Cheng A, Osmond DH. **Decline in HIV infectivity following the introduction of highly active antiretroviral treatment.** *AIDS* 2004; **18**:81–88.
78. Hall I, Byers RH, Ling Q, Espinoza L. **Racial/ethnic and age disparities in HIV prevalence and disease progression among men who have sex with men in the United States.** *Am J Public Health* 2007; **97**:1060–1066.
79. Wortley PM, Chu SY, Diaz T, Ward JW, Doyle B, Davidson AJ, *et al.* **HIV testing patterns: where, why, and when were persons with AIDS tested for HIV?** *AIDS* 1995; **9**:487–492.
80. Colfax GN, Buchbinder SP, Cornelisse PGA, Vittinghoff E, Mayer K, Celum C. **Sexual risk behaviors and implications for secondary HIV transmission during and after HIV seroconversion.** *AIDS* 2002; **16**:1529–1535.
81. Centers for Disease Control and Prevention. **Adoption of protective behaviors among persons with recent HIV infection and diagnosis: Alabama, New Jersey, and Tennessee, 1997–1998.** *MMWR Morb Mortal Wkly Rep* 2000; **49**:512–515.
82. Marks G, Crepaz N, Janssen RS. **Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA.** *AIDS* 2006; **20**:1447–1450.
83. Romero EG, Teplin LA, McClelland GM, Abram KM, Welty LJ, Washburn JJ. **A longitudinal study of the prevalence, development, and persistence of HIV/sexually transmitted infection risk behaviors in delinquent youth: Implications for healthcare in the community.** *Pediatrics* 2007; **119**:e1126–e1141.
84. Ellen JM, Aral SO, Madger LS. **Do differences in sexual behaviors account for the racial/ethnic differences in adolescents' self-reported history of a sexually transmitted disease?** *Sex Transm Dis* 1998; **25**:125–129.
85. Hallfors DD, Iritani BJ, Miller WC, Bauer DJ. **Sexual and drug behavior patterns and HIV/STD racial disparities: The need for new directions.** *Am J Public Health* 2007; **97**:125–132.
86. Harawa NT, Greenland S, Cochran SD, Cunningham WE, Visscher B. **Do differences in relationship and partnership attributes explain disparities in sexually transmitted disease among young white and black women?** *J Adol Health* 2003; **32**:187–191.
87. Pepin J. **From the Old World to the New World: an ecologic study of population susceptibility to HIV infection.** *Trop Med Int Health* 2005; **10**:627–639.
88. Millett GA, Malebranche D, Peterson JL. **HIV/AIDS Prevention Research among Black Men who have Sex with Men: Current Progress and Future Directions.** In: Meyer IH, Northridge ME, editors.*The Health of Sexual Minorities: Public Health Perspectives on Lesbian, Gay, Bisexual and Transgender Populations.* New York: Springer; 2007. pp. 539–565.

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Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities

Patrick S. Sullivan[a,b], Laura Salazar[a], Susan Buchbinder[c] and Travis H. Sanchez[b]

Background: HIV incidence in the United States among men who have sex with men (MSM) has been increasing since 2000, and MSM remain the most heavily impacted risk group in the US HIV epidemic.

Methods: We modeled HIV transmissions, using data from MSM in five US cities from the National HIV Behavioral Surveillance System, the HIVNET Vaccine Preparedness Study, and other published data. Annual HIV transmissions were estimated by partner type (main or casual) and by sex type (receptive anal intercourse, insertive anal intercourse, or oral sex).

Results: Sixty-eight percent [95% confidence interval (CI) 58–78) of HIV transmissions were from main sex partners because of a higher number of sex acts with main partners, more frequent receptive roles in anal sex with main partners, and lower condom use during anal sex with main partners. By sex type, 69% (95% CI 59–79) of infections were from receptive anal intercourse, 28% (95% CI 19–38) were from insertive anal intercourse, and 2% (95% CI 0–5) were from oral sex. The model-based estimated HIV incidence rate was 2.2% (95% CI 1.7–2.7) per year. Sensitivity analyses demonstrated estimates of transmission from main sex partners as low as 52% (95% CI 41–62) and as high as 74% (95% CI 68–80).

Conclusion: According to our model, most HIV transmissions among MSM in five US cities are from main sex partners. HIV prevention efforts should take into account the risks of HIV transmissions in male partnerships, and couples-based HIV prevention interventions for MSM should be given high priority in the US HIV prevention research portfolio.
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AIDS 2009, **23**:000–000

Keywords: HIV, main sex partners, men who have sex with men, transmission risk

Introduction

Men who have sex with men (MSM) have been the predominantly affected risk group since the earliest days of the US HIV epidemic and continue to be the risk group most commonly diagnosed with HIV in the national HIV Surveillance System [1]. Recent data indicate that rates of reported HIV diagnoses have been increasing by over 8% annually since 2001, with the sharpest increases occurring among the youngest (aged 13–24 years) and oldest (aged ≥45 years) MSM and black MSM [2]. MSM are the only risk group with increasing HIV incidence since 2000 [3]. Recently, calls have emerged for a renewed focus on developing novel HIV prevention approaches for US MSM [4].

[a]Emory University Rollins School of Public Health, [b]Centers for Disease Control and Prevention, Atlanta, Georgia, and [c]San Francisco Department of Public Health, San Francisco, California, USA

Correspondence to Patrick Sullivan, DVM, PhD, Rollins School of Public Health, 1518 Clifton Road, 4th Floor, Atlanta, GA 30322, USA.

E-mail: pssulli@emory.edu
Received: 23 October 2008; revised: 28 February 2009; accepted: 16 March 2009.

DOI:10.1097/QAD.0b013e32832baa34

ISSN 0269-9370 © 2009 Wolters Kluwer Health | Lippincott Williams & Wilkins

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An earlier report that most HIV infections among young MSM in the Netherlands are attributable to main sex partners [5], and a recent study [6] from Africa documenting that most HIV transmissions among male–female couples in Zambia and Rwanda are from cohabiting sex partners, led us to question the relative role of transmissions from main sex partners in the United States. We developed a model of HIV transmission based on survey data and HIV test results from respondents to Center for Disease Control and Prevention (CDC)'s National HIV Behavioral Surveillance System (NHBS) among MSM and other published and publicly available data [7,8].

Methods

Data sources

The primary data sources were a five-city subset of the NHBS data from the 2003 to 2005 cycle, which interviewed and conducted HIV testing among MSM recruited using venue–time–space sampling [9] in five US cities (Baltimore, Los Angeles County, Miami, New York, and San Francisco and the Greater Bay Area) [10,11], and the HIVNET Vaccine Preparedness Study (VPS), which collected data from MSM in six US metropolitan areas (Boston, Chicago, Denver, New York, San Francisco, and Seattle) from 1995 to 1997 (National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services. Vaccine Preparedness Study, Uninfected Participant Cohort, FHCRC-HIVNET Statistical Center Version, March 2000). Because HIV testing was offered only during limited time periods in the five NHBS cities, not all men who completed the interview were offered HIV testing. During the period when HIV testing was offered, 2267 men completed the survey and 1777 (79% of these participants) agreed to be HIV tested. A total of 3617 MSM participated in the VPS study.

NHBS data were used to estimate numbers of MSM with main and casual partners in a year, average numbers of casual partners for men who had them, proportional distribution of partner serostatus, proportional distribution of sex episodes that involved receptive anal intercourse (RAI), insertive anal intercourse (IAI), or oral sex, proportion of anal intercourse that was unprotected by condoms, the prevalence of HIV by partner type (main versus casual), and the proportion of unrecognized HIV infection. Data on sex behaviors were from last sex; respondents were asked separately about last sex with both main and casual partners, when applicable. VPS data were used to approximate the number of sexual episodes per year for men with main and casual sex partners; because of the specific information available from VPS, we estimated sexual episodes per year in the following way. To estimate sexual episodes per year with main partners, we used data about number of oral or anal sex acts in the prior 6 months from the baseline interview and from 6, 12, and 18-month follow-up interviews for men who reported a single main partner. To estimate sexual episodes with causal partners, we used data from the same interview periods from men who had one or more casual partners, but not a main partner during the prior 6 months. Six-month estimates for episodes were annualized by multiplying by two.

We tested for differences in the distribution of demographic factors between NHBS respondents who were and were not tested for HIV and between NHBS respondents and VPS participants using χ^2 test. Published data were used to estimate per anal sex episode risk of HIV transmission [7,8]. Estimates of HIV transmission from the VPS data were updated, using the final study data from the VPS study; earlier estimates were published before the VPS data were finalized.

Modeling approach

To characterize new HIV infections, which would be expected to occur among a hypothetical cohort of 3652 HIV-negative MSM with the behavioral characteristics of the NHBS MSM respondents, we summed the estimated number of transmissions for each combination of partner type (main or casual), sex act (RAI, IAI, and oral sex), and reported partner serostatus (negative, positive, and unknown):

$$\text{Transmissions} = \sum_{\substack{i = \text{main, casual} \\ j = \text{neg, pos, unk} \\ k = \text{RAI, IAI, oralsex}}} N(i) \times S(i,j,k) \times U(i,j,k) \times H(i,j) \times R(k)$$

where N is the number of men reporting having main or casual partners in the last year, S is the number of annual sex acts in the last year, U is the proportion of sex acts unprotected by condoms, H is the estimated true prevalence of HIV infection among partners, R is the per act risk of HIV transmission, i is the type of sex partner (main or casual), j is the reported partner HIV status (negative, positive, and unknown), and k is the type of sex act (receptive anal, insertive anal, and receptive oral)

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Table 1. Input parameters and data sources used in a model of HIV transmissions among men who have sex with men, five US cities.

Variable	Data source	Comments
N (number of men)	NHBS	Number of men reported to be HIV negative or of unknown HIV status who provided complete information on their last main and casual (if applicable) partners. In our model, *N* represents a hypothetical cohort of HIV-negative MSM with the behavioral characteristics of the NHBS respondents.
S (number of sex acts)	VPS (number of acts/year with main and casual partners)	From VPS data, separate estimates were made for the number of sex acts (anal or oral) for men who had only a main partner, and men who had at least one casual partner.
	NHBS (number of casual partners/year; proportional distribution of sex acts among RAI, IAI, and oral sex by partner type and reported partner serostatus)	From NHBS, we calculated the number of casual partners separately for men who had main partners only, both main and casual partners, and casual partners only. Because NHBS defined a main sex partner as 'someone who you feel committed to above all others', we considered that men who reported more than one main sex partner per year must have had serial main partners, and considered all men who reported multiple main partners during the year as having one partner for the purposes of calculating total annual sex acts with main partners. We considered only receptive oral sex acts (the only oral sex associated with significant risk of HIV acquisition) to contribute to HIV transmission risk, and therefore multiplied the total number of estimated oral sex acts by 0.5. We used the proportional distribution of sex acts at last sex as a proxy for the population distribution of sex acts with a certain partner type of the model year [12].
U (proportion of sex acts unprotected by condoms)	NHBS	We calculated partner type-sex act-reported partner HIV status-specific rates of not using condoms. We included in this calculation an estimated number of sex acts reported to be protected by condoms but when condom failure occurred, using an estimate of condom failure (2.1%) during anal sex derived from analysis of VPS data [13]. Thus, the proportion of acts not protected by condoms is the sum of the proportion of acts in which no condom was used, and 2.1% of the proportion of acts in which a condom was used but presumed to have failed.
H (prevalence of HIV infection among partners)	NHBS five-city data [11]	We used data from NHBS respondents who were tested for HIV infection in the study to estimate true HIV prevalence and unrecognized HIV infection by partner type. This requires the assumption that NHBS respondents were also reflective of their own sex partners with respect to HIV prevalence and awareness of HIV serostatus (see Discussion). For partners who were reported to be HIV-positive, the prevalence of HIV infection was assumed to be 100%. For partners who were reported to have unknown HIV serostatus, the HIV prevalence was estimated to be the partner-type specific prevalence of HIV. For partners who were reported to be HIV-negative, the HIV prevalence was estimated to be the product of the partner-type-specific prevalence of HIV, and the partner-type specific proportion of HIV-infected men who reported being HIV-negative.
R (per act risk of HIV transmission)	Published data	Per-episode risks of HIV transmission were according to the method of Vittinghoff *et al.* [7], using final data from the study on which the original methods and estimates were reported.

IAI, insertive anal intercourse; MSM, men who have sex with men; NHBS, National HIV Behavioral Surveillance System; RAI, receptive anal intercourse; VPS, Vaccine Preparedness Study.

The data sources and detailed information about model inputs are summarized in Table 1 ([7,11–13]). Total annual sex acts with main and casual partners were apportioned to one of nine categories [three levels of sex type (k) by three levels of partner's reported HIV status (j)]. Total numbers of sex acts with main and casual partners were multiplied, separately, by the proportion of sexual episodes that occurred with each stratum of sex type* reported partner HIV status. The result was an estimated annual number of RAI, IAI, and oral sex acts, by partner type and serostatus.

The total numbers of unprotected anal sex episodes were estimated by multiplying partner type–sex type–seroconcordance-specific condom usage rates (U) by the total number of sex acts (S) in the stratum. For oral sex, we assumed, on the basis of published literature, that the rates of condom use during oral sex were low enough to be negligible [14].

The number of unprotected sex acts with HIV-infected partners was estimated by multiplying the number of unprotected sex acts by the partner type–sex act-specific

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rates of HIV prevalence (H, as determined by HIV testing of respondents). The estimated new HIV infection was calculated by multiplying the total number of unprotected sex acts with infected partners by the per-act risk of HIV transmission for that act (R).

Thus, estimates of annual HIV infections were calculated and attributed to main or casual partners, RAI, IAI, or oral sex and perceived partner serostatus. The 95% confidence intervals (CIs) around the proportions were calculated using standard formulae, assuming a normal distribution. The annual HIV incidence rate was calculated by dividing the total number of predicted HIV transmissions by the total number of men, with 95% CIs.

We repeated the modeling process stratified by demographic variables when there were significant differences between the NHBS and VPS respondents (age, race, and education). The stratified models used stratum-specific estimates of partner numbers, distribution of sex acts, condom use rates, HIV prevalence, and undiagnosed HIV infection from NHBS data. We summed across strata to generate overall estimates from the stratified analysis. We tested for a trend in prevalence of transmission from main partners, from RAI, and from partners of unknown serostatus across age groups using the Cochran–Armitage test (SAS version 9.2; SAS Institute Inc., Cary, North Carolina, USA).

Sensitivity analyses

To determine how sensitive our model was to plausible changes in input parameters, we conducted sensitivity analyses (Table 2). We varied key input parameters to upper and lower 95% CIs and considered alternative data sources for estimates of annual sex episodes with main and casual partners. We constructed an overall scenario that favored transmission from casual partners, conducted an analysis restricted to the two cities (New York and San Francisco) where both NHBS and VPS data were collected, and constructed an analysis using only data from participants who were also HIV tested as part of the study. We also tested an alternate measure of seroprevalence by using direct estimates of seroprevalence in four groups (main and casual partners who reported being HIV-negative or HIV-unknown). Finally, we varied each individual variable according to an appropriate probability distribution and used Monte Carlo simulation (@RISK, Palisade Corporation, Ithaca New York, USA) to generate 95% CIs around the estimate of transmission from main partners and conducted a Monte Carlo simulation allowing all variables to vary according to their respective probability distributions.

To address the concern that the distribution of type of sex act might be correlated with frequency of sex (e.g., that men who reported higher numbers of sex acts might have a higher proportion of RAI), we used VPS data to model the relationship between number of annual sex acts and the proportion of sex which was RAI.

Results

A total of 3652 MSM respondents to the NHBS survey provided complete information on recent sex partners and were included in the analysis group. Men who provided complete information differed statistically from the 1777 NHBS respondents tested for HIV in the five cities by age group, educational attainment, and city of recruitment (Table 3), but the magnitude of the differences was small. Included NHBS respondents differed from MSM in the VPS study by age group, race, and educational attainment.

NHBS respondents reported information from most recent sex with a total of 2395 main sex partners and 2850 casual sex partners (Table 4). Forty-four percent of NHBS respondents reported both main and casual partners in the 12 months before interview. Main partners were significantly less likely to be of unknown HIV serostatus ($P < 0.0001$). Men were significantly less likely to use condoms with main partners (versus casual partners) for RAI and IAI with partners who were reported to be HIV negative (43 versus 73% for RAI, 43 versus 71% for IAI; $P < 0.0001$ for both comparisons) or with unknown serostatus (57 versus 76% for RAI, 59 versus 75% for IAI; $P < 0.0001$ for both comparisons); condom use was similar with main and casual HIV-positive partners ($P = 0.76$ and $P = 0.87$ for RAI and IAI, respectively). Men were more likely to have had RAI with their main partner (40%) than with their casual partner (26%) at last sex ($P < 0.0001$ by χ^2). Mean annual number of main partners was 1.5 for men with only main partners and 1.3 for men with both main and casual partners; 25% of men with only main partners and 10% of men with both main and casual partners reported more than one main partner. Among NHBS respondents, the proportion of men who had only main partners who were truly HIV-infected was 24% and of men who had any casual partner it was 26%; in the same groups, proportions of HIV-infected men who were unaware of their HIV infection were 43 and 49%, respectively. We estimated that NHBS respondents had 194 875 annual sex acts with main partners and 173 450 annual sex acts with casual partners.

Most transmissions (68%) were estimated to be from main partners in the primary analysis and in models stratified by age, race, and educational attainment (Fig. 1a). There was a significant trend in proportion of transmissions from main partners across age groups by Cochran–Armitage test (two-tailed $P = 0.002$, Fig. 1a). There was no trend in proportion of transmissions from RAI or from partners of unknown serostatus across age groups. By sex type, most

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Table 2. Sensitivity analyses of a model to estimate HIV transmissions among men who have sex with men, five US cities.

	Base case		Sensitivity analysis		
Parameter	Source	Estimate	Source	Estimate/range	% Transmissions from main partners (95% CI)
Number of sex episodes/year	Vaccine Preparedness Study	Main, 80.7/year; casual, 4.0/year	VPS	95% CI on estimates:	
				Main, 76.2–85.1	67 (58–77), 70 (61–79)
				Monte Carlo simulation on annual sex episodes with main partners[a]	68 (46–85)
				Casual, 3.0–4.9	74 (65–83), 64 (54–73)
				Monte Carlo simulation on annual sex episodes with casual partners[b]	71 (47–85)
			National Survey of Health and Social Life[c]	Main, 60.4/year; casual: 4.3/year	66 (54–73)
			General Social Survey[d]	Main, 48.2/year; casual: 4.2/year	62 (54–70)
Per episode risk of HIV transmission	Method of Vittinghoff *et al.* [7] with final study data	URA, 0.65%; UIA, 0.16%; OS, 0.013%	Vargehese *et al.* [8]	RR of transmission: oral sex = 1, UIA = 13, UAI = 100	74 (68–80)
Proportion of partners with HIV infection	NHBS (five cities)	Main 24% Casual 26% Main partner reported to be negative 10% Main partner reported to be unknown 24% Casual partner reported to negative 13% Casual partner reported to unknown 26%	NHBS (five cities)	95% CI on proportions: Main 20, 29% Monte Carlo simulation on proportion of main partners with HIV infection[c] Casual 26%, 30% Monte Carlo simulation on proportion of casual partners with HIV infection[c] Direct measures of prevalence in main and casual partners from NHBS	65 (55–75), 72 (63–80) 71 (70–72) 70 (61–79), 67 (58–76) 71 (69–73) 66 (56–76)
Proportion of partners with unrecognized HIV infection	NHBS (five cities)	Main 43% Casual 49%	NHBS (five cities)	95% CI on proportions: Main 31%, 52% Monte Carlo simulation on proportion of HIV-infected main partners with unrecognized infection[e] Casual 44%, 54% Monte Carlo simulation on proportion of HIV-infected casual partners with unrecognized infection[e]	65 (55–75), 71 (62–80) 71 (68–73) 69 (60–78), 68 (59–77) 71 (71, 71)
Aggregate scenario favoring transmission by casual partners	–	–	NHBS, VPS, Vittinghoff *et al.* [7]	Lower CI for estimates of sex frequency with main partners (76.2), upper CI for sex frequency with casual partners (4.9), lower CI for HIV prevalence among main partners (20%), upper CI for HIV prevalence among casual partners (30%), lower CI for undiagnosed prevalence among main partners (31%), upper CI for undiagnosed prevalence among casual partners (54%)	52 (41–62)
Restricted analysis to two cities that collected data in both studies	–	–	NHBS, VPS, Vittinghoff *et al.* [7]	New York and San Francisco only	69 (53–85)
Restricted analysis to only respondents who were HIV tested in the study	–	–	NHBS, VPS, Vittinghoff *et al.* [7]		72 (57–87)
Monte Carlo simulation varying all factors according to their respective probability distribution	–	–	NHBS, VPS, Vittinghoff *et al.* [7]		67 (29–92)

CI, confidence interval; NHBS, National HIV Behavioral Surveillance; UIA, unprotected insertive anal intercourse; URA, unprotected receptive anal intercourse; VPS, Vaccine Preparedness Study.
[a]Negative binomial distribution.
[b]Inverse Gaussian distribution.
[c]National Health and Social Life Survey; 1992 [United States] [computer file]. ICPSR version, Chicago, Illinois: University of Chicago and National Opinion Research Center [producer]; 1995. Ann Arbor, Michigan: Inter-university Consortium for Political and Social Research [distributor]; 1995.
[d]General social surveys, 1972–2006: cumulative codebook. Principal investigator, James A. Davis, Director and Co-principal investigator, Tom W. Smith. – Chicago: National Opinion Research Center; 2007. 2552 pp., 28 cm. – (National Data Program for the Social Sciences Series, no. 18).
[e]Normal distribution.

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Table 3. Characteristics of men who have sex with men and studies in datasets used to model HIV transmissions in five US cities.

Characteristic	NHBS respondents, *n* (%)	NHBS respondents who were tested for HIV as part of NHBS, *n* (%)	Vaccine Preparedness Study, *n* (%)
Total	3652	1777[a]	3617
Age group (years)[b,c,d,e]			
18–24	759 (21)	415 (23)	593 (16)
25–29	727 (20)	314 (17)	841 (23)
30–39	1289 (35)	593 (33)	1381 (38)
≥40	877 (24)	455 (26)	802 (22)
Race/ethnicity[c,d,e,g]			
White, non-Hispanic	1384 (38)	619 (35)	2549 (71)
Black, non-Hispanic	612 (17)	443 (25)	339 (9)
Hispanic	1121 (31)	470 (26)	551 (15)
Other races[f]	535 (14)	245 (14)	176 (5)
Educational attainment[c,d,e,h]			
Less than high school	219 (6)	166 (9)	191 (5)
High school or GED	613 (17)	391 (22)	448 (12)
More than high school	2818 (77)	1219 (69)	2978 (82)
City of recruitment[c]			
Baltimore	421 (12)	470 (26)	–
Boston		–	322 (9)
Chicago		–	594 (16)
Denver		–	676 (18)
Los Angeles County[i]	1132 (31)	378 (21)	–
Miami[i]	624 (17)	232 (13)	–
New York City	385 (11)	336 (19)	659 (18)
San Francisco[i,j]	1090 (30)	361 (20)	788 (22)
Seattle	–	–	578 (16)

GED, General Education Diploma; NHBS, National HIV Behavioral Surveillance.
[a]Data include 10 respondents whose data were not finalized at the time of the earlier published analysis of HIV testing [11].
[b]Age groups for VPS study were 18–25, 26–30, 31–40, and at least 41 years of age.
[c]$P < 0.05$ by χ^2 comparing NHBS respondents to NHBS HIV testers.
[d]$P < 0.05$ by χ^2 comparing NHBS respondents to VPS respondents.
[e]$P < 0.05$ by χ^2 comparing NHBS HIV testers to VPS respondents.
[f]Includes Asian/Pacific Islander, American Indian/Alaskan Native, men reporting multiple races, and men who refused to provide race information.
[g]Two VPS respondents had missing race.
[h]Two NHBS respondents had missing information on educational attainment.
[i]Surveys were completed for 6 months when testing was not available, so nontesters represent a combination of respondents who were not offered testing, and respondents who declined testing. In other NHBS cities, nontesters represent those who declined testing.
[j]For NHBS, includes the Greater Bay Area.

Table 4. Number and percentage of participants who reported being HIV negative or reported not knowing their HIV status who had unprotected anal sex during their most recent sexual encounter with a casual or main partner, by partner's HIV serostatus (National HIV Behavioral Surveillance System, men who have sex with men, five US Cities, November 2003–April 2005).

	Insertive				Receptive				
	Anal sex		Unprotected anal sex		Anal sex		Unprotected anal sex		
Partner's reported HIV status	No.	(%)[a]	No.	(%)[b]	No.	(%)[a]	No.	(%)[b]	Total
Main partner									
HIV negative	1005	(75)	574	(57)	710	(74)	408	(57)	
HIV positive	69	(5)	29	(42)	50	(5)	10	(20)	
Unknown	263	(20)	107	(41)	196	(21)	84	(43)	
Total	1337		710		956		502[c]		2395[d]
Casual partner									
HIV negative	446	(38)	128	(29)	296	(39)	79	(27)	
HIV positive	42	(4)	17	(40)	18	(2)	3	(17)	
Unknown	686	(58)	170	(25)	441	(58)	105	(24)	
Total	1174		315[e]		755		187[f]		2850

[a]Percentages are column percents (i.e. add to 100% within main and casual partners).
[b]Percentages are row percents (i.e. the percentage of the total number of anal sex acts that were not protected by condoms).
[c]Two men had missing data on condom use.
[d]The number of sex acts is greater than the number of sex partners because some men reported having both insertive and receptive anal sex at last sex.
[e]One man had missing data on condom use.
[f]Three men had missing data on condom use.

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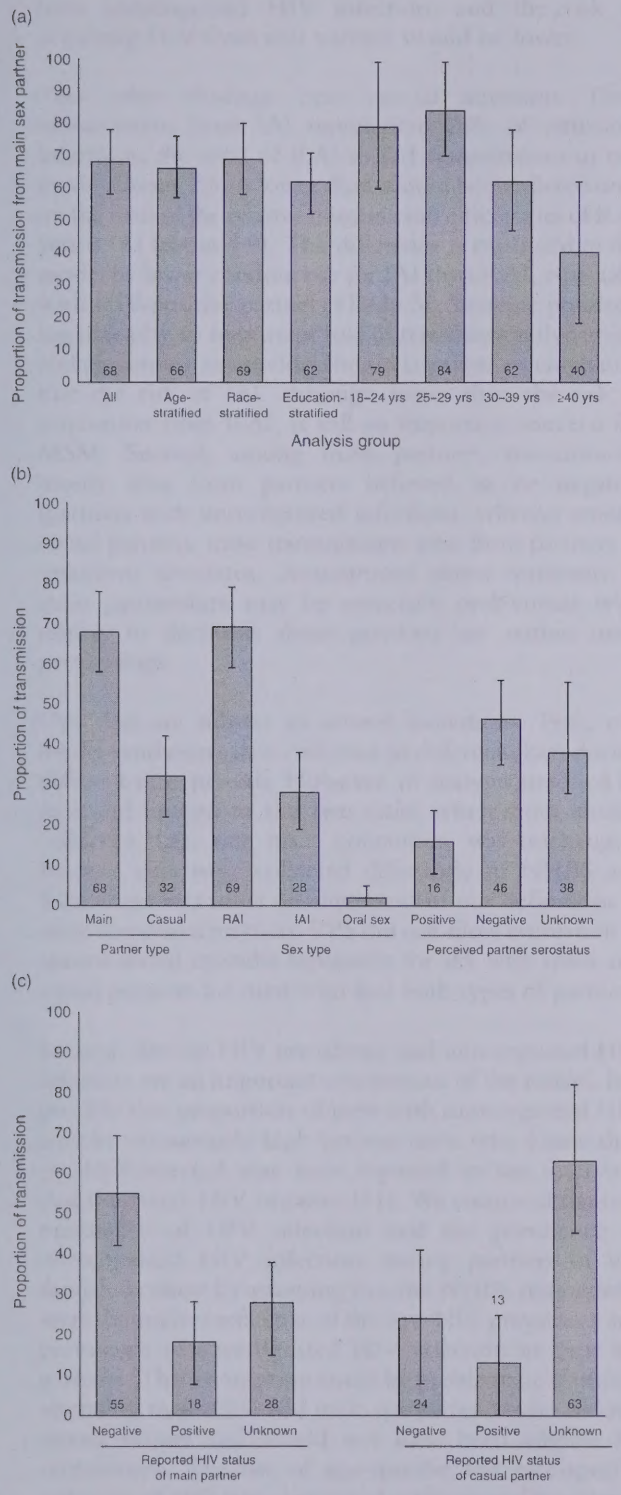

Fig. 1. Proportions of HIV transmissions by partner type, sex type, and perceived partner serostatus (a), proportion of HIV transmissions from main sex partners overall, in stratified analyses, and by age (b), and proportion of transmissions by reported HIV serostatus of partner and partner type (c) among men who have sex with men in five US cities, 2003–2005. RAI, receptive anal intercourse; IAI, insertive anal intercourse.

transmissions were estimated to arise from RAI; among all men, most transmissions were estimated to arise from partners believed to be HIV-negative (Fig. 1b). Among transmissions from main partners, most were from partners reported to be HIV negative; among transmissions from casual partners, most were from partners of unknown HIV status (Fig. 1c).

The predicted annual HIV incidence for the overall analysis was 2.2% (CI 1.7–2.7%). In sensitivity analyses (Table 2), the highest and lowest estimates of the proportion of HIV transmissions from main partners were 74 and 52%, respectively.

In addressing our concern that the distribution of type of sex act might be correlated with frequency of sex, we found that among VPS respondents, frequency of sex was significantly ($P < 0.0001$) but not meaningfully associated with proportion of sex acts, which were RAI. Only 1% in the variability of proportion of sex acts, which were RAI was explained by frequency of sex ($r^2 = 0.01$).

Discussion

Our finding that most HIV transmissions among this group of urban MSM arose from sex with main partners was driven by several factors. First, men have more sex with their main partners than with their casual partners each year, over 10% more by our estimates. Second, men were 14% more likely to have RAI, which carries a higher per-act risk of HIV transmission, with their main partners than with their casual partners. Third, men in our study, and others [15–19], were less likely to use condoms for anal sex with their main partners; partner serostatus–sex type-specific rates of sex not protected by condoms were 16–31% higher with main partners than casual partners in our data. Taken together, these factors result in more episodes of unprotected anal sex, especially RAI, with main partners than with casual partners. Although prevalence of HIV infection and of undiagnosed HIV infection were marginally lower in main than casual partners in our model (Table 2), these differences were too small to overcome the larger differences favoring more unprotected RAI acts with main partners.

Our finding of a decreasing trend by age in transmission from main partners is driven by higher proportions of undiagnosed HIV infection in younger men; a previous analysis [10] of NHBS data showed that the prevalence of undiagnosed HIV was as high as 79% among younger MSM. There may be differences in how younger men define main partners or differences in the length of relationships with main partners. It is likely that, for many older men, main partners may have been established for many years. Given the frequency of HIV testing among MSM [10], a main partner of long duration is less likely to

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have unrecognized HIV infection, and the risk of acquiring HIV from that partner would be lower.

Two other findings bear special attention. First, transmissions from IAI represented 28% of estimated infections; the ratio of RAI to IAI transmissions in our model (about 2.5) is lower than would be predicted only on the basis of the relative transmission efficiencies of RAI versus IAI (about 4.0). The difference is explained in the model by lower condom use for IAI than RAI, especially with HIV-positive partners (Table 3). Strategic positioning may play an important role in transmission dynamics, and prevention counselors should continue to emphasize that the risk of IAI, although lower than the risk of acquisition from RAI, is still an important concern for MSM. Second, among main partners, transmissions mostly arise from partners believed to be negative (partners with unrecognized infection), whereas among casual partners, most transmissions arise from partners of unknown serostatus. Assumptions about serostatus in main partnerships may be especially problematic with respect to decisions about condom use within main partnerships.

Our data are subject to several limitations. First, our model synthesizes data collected in different cities during different time periods. However, in analyses stratified by race and limited to the two cities where both studies collected data, our main conclusion was unchanged. Because data were collected differently in NHBS and VPS, there was some misalignment of our definitions of main and casual partners: VPS did not allow estimation of annual sexual episodes separately for sex with main and casual partners for men who had both types of partners.

Second, data on HIV prevalence and unrecognized HIV infection are an important component of the model. It is possible that proportion of men with unrecognized HIV may be erroneously high because men who know they are HIV-infected may have reported in the interview that they were HIV negative [11]. We estimated the true prevalence of HIV infection and the prevalence of unrecognized HIV infection among partners of our modeled cohort by assuming that the NHBS respondents were themselves reflective of the true HIV prevalence and prevalence of unrecognized HIV infection in their sex partners. This assumption could be problematic if venue-attending men often had male sex partners who did not attend venues and would not have been eligible for recruitment. The use of age-specific and race-specific estimates of HIV prevalence and undiagnosed prevalence require the assumption that most partnerships are similar with respect to age and race. If this assumption were violated, it would be more likely to affect the race- and age-specific estimates; the overall estimates would still be valid as long as the types of sex partners our respondents sought attended venues and were eligible for sampling in the NHBS study.

Third, our model does not account for some other, important aspects that impact HIV transmission among MSM. For example, infection with sexually transmitted diseases (STDs) increases the per-act risk of HIV transmission and acquisition [20]; STD infections have increased among MSM in the United States in recent years [21,22]. Our model did not account for the impact of STDs on HIV transmission risk. The VPS data used to estimate HIV transmission risks were collected before the broad availability of HAART; HAART prescription, when associated with suppression of viral load, is expected to substantially reduce the per-episode risk of HIV transmission [23]. Also, we did not account for varying infectivity of HIV-infected persons in different stages of HIV disease (acute infection versus latent period), for certain harm-reduction practices such as premature withdrawal, or for the potential impact of circumcision [24] on HIV transmission rates.

Our modeling approach did not allow us to censor men at the time of infection; therefore, our model may have overestimated transmissions. Because the likelihood and magnitude of this issue would be related to number of sex acts, it would tend to differentially overestimate transmissions from main partners. Our assumption that men reporting more than one male sex partner per year contributed the same number of transmissions as men reporting one male partner may also be problematic. Men who have serial main partners may actually be at greater risk of HIV infection, so our assumption may lead to an underestimate of transmissions in main partners.

Neither NHBS nor VPS collected data on duration of partnerships. If most HIV transmissions occur from main sex partners, then substantial rates of main partner change would be prerequisite to sustaining onward HIV transmission among MSM. In our study, a substantial proportion of men with main partners reported more than one main partner in the previous 12 months. Previous studies [25,26] in cross-sectional groups of MSM have documented mean duration of current primary relationships of 17 and 40 months. For men who have main partnerships of longer duration, the risk of HIV transmission from main partners would likely decrease over time. The frequency of sex within main partnerships declines over time in relationship [27]. Also, it is likely that the longer relationships (especially monogamous relationships) last, the more likely it is that both partners would have accurate knowledge of HIV serostatus. Of note, structural interventions to promote stability of relationships between men have been suggested as an approach to addressing the HIV epidemic in MSM [4]; if such approaches are implemented and are successful in promoting stability, longer duration of primary relationships may be an important mediator in reducing HIV incidence and would be expected to decrease the proportion of infections attributed to main partners in our model.

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Our data are not generalizable to all MSM in the United States. Both source studies recruited sexually active MSM in urban areas; our findings do not apply to MSM in more rural areas. If MSM in our hypothetical cohort migrated to areas of varying HIV prevalence or undiagnosed HIV infection, our model would likely misrepresent incidence. Although diverse venues such as retail establishments and social organizations were included in the NHBS sampling frame [9], most NHBS participants were recruited from bars or dance clubs [10]. It is likely that MSM who do not attend NHBS venues, or who attend such venues infrequently, have patterns of behavioral risk that are different from those recruited to NHBS.

Despite these limitations, we believe that our model is a reasonable one. Our model estimated an annual HIV incidence of 2.2% (CI 1.7–2.7%). A meta-analysis [28] of published estimates of HIV incidence from 1995 to 2005 reported a weighted mean incidence of 2.3% (CI 2.0–2.65%) for MSM recruited in community settings. The median transmission rate derived from the serologic algorithm for HIV seroconversion (STARHS) from the same respondents in the five NHBS cities who were included in our analysis was 2.3% (range by city, 1.2–8.0%) [11]. The comparability of our estimates of HIV incidence derived by modeling and other estimates of HIV incidence derived using biological markers of recent infection suggests that our model makes reasonable assumptions.

Our data suggest that existing HIV prevention interventions should address issues related to risk within male partnerships and issues of testing and disclosure, and interventions that focus on MSM couples should also be considered. To date, most HIV prevention interventions tested in MSM (80%) have been group level interventions [29]. Many of our estimated transmissions arose in partnerships, which were believed by the participants to be seronegative concordant relationships. It is clear that men, whether they believe themselves to be HIV negative or know that they are HIV positive, do communicate a negative serostatus to sex partners [30,31]. Couples who believe themselves to be concordant seronegative may also benefit from improved knowledge of serostatus and risk reduction strategies. Also, the current MSM cycle of the NHBS system is interviewing MSM in 21 US cities during 2008; in the 2008 cycle, all men were offered HIV testing, and data on concurrency and duration of sexual partnerships were collected. This analysis should be repeated with data from this broader group of cities, to determine whether our finding is robust over time and in a more heterogeneous group of US cities.

A recent commentary [32] on HIV prevention noted that, 'for too long, AIDS activists, academics, and national and international institutions have given insufficient emphasis to aligning prevention priorities with epidemic transmission dynamics'. Such is the case with available HIV prevention interventions for MSM in the United States. Although over 50% of new US HIV infections are among MSM, only eight of 36 (22%) HIV-prevention interventions designated as 'best-evidence' prevention interventions by the CDC have been tested with MSM [33]. New HIV prevention interventions for US MSM are needed and should be responsive to the current behavioral risk patterns and transmission characteristics of the US MSM epidemic. Our data suggest that the development and testing of HIV prevention interventions for MSM couples, a historically understudied area of HIV prevention, may be important as we approach the fourth decade of the US HIV epidemic.

Acknowledgements

The authors express thanks to the Principal Investigators of the NHBS surveillance sites for the MSM data collection, who participated in the protocol development, oversaw the collection and local management of behavioral and HIV testing data, and provided critical review of the manuscript: Baltimore, Colin Flynn; Los Angeles County, Trista Bingham; Miami, Marlene LaLota; New York, Alan Neaigus; San Francisco and the Greater Bay Area, H. Fisher Raymond.

The authors express thanks to Dr Eric Vittinghoff, who provided updated estimates of HIV transmission risk for use in the model and thoughtful critique of the manuscript.

P.S. conceived the analysis, conducted the statistical analyses, and drafted the manuscript. L.S. participated in the development of the analysis plan, assisted in preparation of the manuscript, and provided perspective on how local data collection practices may have affected variable quality. S.B. provided critical input into the specifications of the model, coordinated updating of the HIV transmission risks, and provided critical input on the manuscript. T.S. conceived the analysis with P.S., participated in the development of the analysis plan, and provided critical input on the manuscript. All authors reviewed and provided substantial input to revisions of the manuscript.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

References

1. Centers for Disease Control and Prevention. **HIV/AIDS Surveillance Report, 2005 (vol. 17)**. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2006. pp. 1–46. http://www.cdc.gov/hiv/stats/hasrlink.htm. [Accessed 30 January 2007].
2. CDC. **Trends in HIV/AIDS diagnoses among men who have sex with men: 33 States, 2001–2006**. *MMWR* 2008; **57**:681–686.

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3. Hall HI, Song R, Rhodes P, Prejean J, An Q, Lee LM, *et al.* **Estimation of HIV incidence in the United States.** *J Am Med Assoc* 2008; **300**:520–529.
4. Jaffe HW, Valdiserri RO, De Cock KM. **The reemerging HIV/AIDS epidemic in men who have sex with men.** *JAMA* 2007; **298**:2412–2414.
5. Davidovich U, de Wit J, Albrecht N, Geskus R, Stroebe W, Coutinho R. **Increase in the share of steady partners as a source of HIV infection: a 17-year study of seroconversion among gay men.** *AIDS* 2001; **15**:1303–1308.
6. Dunkle KL, Stephenson R, Karita E, Chomba E, Kayitenkore K, Vwalika C, *et al.* **New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data.** *Lancet* 2008; **371**:2183–2191.
7. Vittinghoff E, Douglas J, Judson F, McKirnan D, MacQueen K, Buchbinder SP. **Per-contact risk of human immunodeficiency virus transmission between male sexual partners.** *Am J Epidemiol* 1999; **150**:306–311.
8. Varghese B, Maher JE, Peterman TA, Branson BM, Steketee RW. **Reducing the risk of sexual HIV transmission: quantifying the per-act risk for HIV on the basis of choice of partner, sex act, and condom use.** *Sex Transm Dis* 2002; **29**:38–43.
9. MacKellar DA, Gallagher KM, Finlayson T, Sanchez T, Lansky A, Sullivan PS. **Surveillance of HIV risk and prevention behaviors of men who have sex with men: a national application of venue-based, time-space sampling.** *Public Health Rep* 2007; **122 (Suppl 1)**:39–47.
10. Sanchez T, Finlayson T, Drake A, Behel S, Cribbin M, Dinenno E, *et al.* **Human immunodeficiency virus (HIV) risk, prevention, and testing behaviors: United States, National HIV Behavioral Surveillance System – men who have sex with men, November 2003–April 2005.** *MMWR Surveill Summ* 2006; **55**:1–16.
11. Centers for Disease Control and Prevention. **HIV prevalence, unrecognized infection, and HIV testing among men who have sex with men: five U.S. cities, June 2004–April 2005.** *MMWR* 2005; **52**:597–601.
12. Rietmeijer CA, Lansky A, Anderson JE, Fichtner RR. **The current good should precede the future best: a response to a response.** *AIDS Educ Prev* 2002; **14**:348–350.
13. Stone E, Heagerty P, Vittinghoff E, Douglas JM Jr, Koblin BA, Mayer KH, *et al.* **Correlates of condom failure in a sexually active cohort of men who have sex with men.** *J Acquir Immune Defic Syndr Hum Retrovirol* 1999; **20**:495–501.
14. Page-Shafer K, Shiboski CH, Osmond DH, Dilley J, McFarland W, Shiboski SC, *et al.* **Risk of HIV infection attributable to oral sex among men who have sex with men and in the population of men who have sex with men.** *AIDS* 2002; **16**:2350–2352.
15. Koblin BA, Chesney MA, Husnik MJ, Bozeman S, Celum CL, Buchbinder S, *et al.* **High-risk behaviors among men who have sex with men in 6 US cities: baseline data from the EXPLORE Study.** *Am J Public Health* 2003; **93**:926–932.
16. Stueve A, O'Donnell L, Duran R, San Doval A, Geier J. **Being high and taking sexual risks: findings from a multisite survey of urban young men who have sex with men.** *AIDS Educ Prev* 2002; **14**:482–495.
17. Poppen PJ, Reisen CA, Zea MC, Bianchi FT, Echeverry JJ. **Serostatus disclosure, seroconcordance, partner relationship, and unprotected anal intercourse among HIV-positive Latino men who have sex with men.** *AIDS Educ Prev* 2005; **17**:227–237.
18. Hart T, Peterson JL. **Predictors of risky sexual behavior among young African American men who have sex with men.** *Am J Public Health* 2004; **94**:1122–1124.
19. Choi KH, Han CS, Hudes ES, Kegeles S. **Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men.** *AIDS Educ Prev* 2002; **14**:472–481.
20. Cohen MS. **HIV and sexually transmitted diseases: lethal synergy.** *Top HIV Med* 2004; **12**:104–107.
21. Division of STD Prevention. Sexually Transmitted Disease Surveillance, 2005. Department of Health and Human Services. Atlanta: Centers for Disease Control and Prevention (CDC); 2006.
22. Ciesielski CA. **Sexually transmitted diseases in men who have sex with men: an epidemiologic review.** *Curr Infect Dis Rep* 2003; **5**:145–152.
23. Gray RH, Wawer MJ, Brookmeyer R, Sewankambo NK, Serwadda D, Wabwire-Mangen F, *et al.* **Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda.** *Lancet* 2001; **357**:1149–1153.
24. Millett GA, Flores SA, Marks G, Reed JB, Herbst JH. **Circumcision status and risk of HIV and sexually transmitted infections among men who have sex with men: a meta-analysis.** *JAMA* 2008; **300**:1674–1684.
25. Halkitis PN, Wilton L, Parsons JT, Hoff CC. **Correlates of sexual risk taking behaviour among HIV seropositive gay men in concordant primary partner relationships.** *Psychol Health Med* 2004; **9**:99–113.
26. Davidovich U, de Wit JB, Stroebe W. **Assessing sexual risk behaviour of young gay men in primary relationships: the incorporation of negotiated safety and negotiated safety compliance.** *AIDS* 2000; **14**:701–706.
27. Blumstein P, Schwartz PW. *American couples: money, work, sex.* New York: William Morrow and Company; 1983.
28. Stall R, Duran L, Wisniewski SR, Friedman MS, Marshal MP, McFarland W, *et al.* **Running in place: implications of HIV incidence estimates among urban men who have sex with men in the United States and other industrialized countries.** *AIDS Behav* 2009 [Epub ahead of print, Feb 10, 2009].
29. Semaan S, Kay L, Strouse D, Sogolow E, Mullen PD, Neumann MS, *et al.* **A profile of U.S.-based trials of behavioral and social interventions for HIV risk reduction.** *J Acquir Immune Defic Syndr* 2002; **30 (Suppl 1)**:S30–S50.
30. Wolitski RJ, Rietmeijer CA, Goldbaum GM, Wilson RM. **HIV serostatus disclosure among gay and bisexual men in four American cities: general patterns and relation to sexual practices.** *AIDS Care* 1998; **10**:599–610.
31. MacKellar DA, Valleroy LA, Behel S, Secura GM, Bingham T, Celentano DD, *et al.* **Unintentional HIV exposures from young men who have sex with men who disclose being HIV-negative.** *AIDS* 2006; **20**:1637–1644.
32. Wilson D, Halperin DT. **'Know your epidemic, know your response': a useful approach, if we get it right.** *Lancet* 2008; **372**:423–426.
33. Centers for Disease Control and Prevention. **Compendium of HIV prevention interventions with evidence of effectiveness [revised]; 2008.** http://www.cdc.gov/hiv/topics/research/prs/evidence-based-interventions.htm. [Accessed 17 April 2008].

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Six Ways the Affordable Care Act will help People with HIV

The Affordable Care Act (ACA) is the new national health care reform law signed by President Obama in 2010. The ACA will make it much easier for people with HIV to get the medical care they need to stay healthy and not pass HIV along to their partners. Here are six ways the ACA will help people with HIV now and in 2014, when full implementation begins.

1. Have a pre-existing condition? You may be able to get coverage now: Right now, health insurance for people with pre-existing conditions (like HIV) is available in every state through Pre-Existing Condition Insurance Plans (PCIPS). Plus, in many states, AIDS Drug Assistance Programs (ADAPs) can help pay the cost of PCIP premiums.

2. In 2014, most very low-income people will be able to get Medicaid coverage. Today Medicaid covers about half of people with HIV in medical care (Kates, 2011), but you have to be so sick that you're disabled to get on the program. In 2014, most people earning less than $14,000 will be able to enroll, no matter how sick or healthy they are.

3. In 2014, working people will have access to more affordable, private health insurance. In 2014, if you earn between about $15,000 and $44,000 a year, you'll be able to receive subsidies to purchase private health insurance through new state-based, regulated exchanges.

4. Private health insurance companies will have to play by the new rules. The health care reform law will finally force health insurance companies to treat consumers fairly. Companies will be required to sell insurance to everyone, even if they have a pre-existing condition like HIV. Insurance companies won't be able to charge you higher rates because you're sick or a woman; and insurance policies won't have annual or lifetime spending caps.

5. Medicare is getting better. For people with HIV who are on Medicare, the Part D prescription drug benefit is already becoming more affordable. Money ADAP spends on your HIV drugs now counts towards your out-of-pocket expenses, so you get through the donut hole (or coverage cap) faster. While you're in the donut hole, you'll pay only 50% of the cost of name-brand drugs, including HIV medications. And starting now, you won't pay anything for preventive screenings.

6. Health care reform will make critical investments in prevention, access to care, and health workforce: The ACA will boost health and wellness efforts by supporting prevention and public health projects, expanding the number of community health centers that provide care to low-income or uninsured people, and investing in the number of primary care doctors and nurses, making it easier to find a medical home.

Of course, health care reform isn't perfect, but starting in 2014 thanks to the new law, hundreds of thousands of uninsured people with HIV will be able to get medications and comprehensive medical care.

Have questions? Need more ideas? Contact Malinda Ellwood, Center for Health Law and Policy Innovation of Harvard Law School and Treatment Access Expansion Project, mellwood@harvard.law.edu, Jessica Terlikowski, AIDS United, jterlikowski@aidsunited.org, or John Peller, AIDS Foundation of Chicago, jpeller@aidschicago.org.

March 2012. For more information, visit HIVHealthReform.org

THE MEDICAID EXPANSION AND PEOPLE WITH HIV/AIDS

The U.S. Supreme Court ruled in June 2012 to uphold the Patient Protection and Affordable Care Act (ACA). However, in a disappointing move, the Court ruled that states that do not comply with the ACA's expansion of Medicaid to individuals up to 138% of federal poverty (around $15,400 per year for an individual) cannot lose federal funding for the *entire* Medicaid program.[i] If states refuse to comply with the expansion, there could be a large number of the lowest income people left out of reform. This fact sheet was developed to assist HIV advocates with making the case for the Medicaid expansion in their state. Analysis of the implications of the Supreme Court decision by various stakeholders will continue, so regularly check the resources at the end of the fact sheet for the latest news and analyses.

Health Reform Is Critical to People with HIV

- An estimated 1.2 million people are living with HIV in the U.S. and need access to high-quality, uninterrupted health care to stay healthy, reduce new HIV infections, and cut long-term health care costs.
- We have the tools to treat HIV/AIDS effectively and to make significant headway against the HIV epidemic in the U.S. Research clearly shows that, with early access to HIV treatment, people with HIV stay healthier and are 96% less likely to transmit HIV to others.[ii]
- National health care reform will put us on the road to an AIDS-free generation by dramatically expanding access to medical care, life-saving HIV treatment, and screening. The National HIV/AIDS Strategy sets a new course for an AIDS-free generation, but its success is in jeopardy without full implementation of the Medicaid expansion.

Full Implementation of the Medicaid Expansion is Essential to Address the HIV Public Health Crisis

- Expanding Medicaid to very low-income people addresses a significant injustice. Across the U.S., low-income people with HIV/AIDS have been left behind as they are forced to rely on emergency rooms and free clinics to get medical care for an infectious, life-threatening disease.
- Full implementation of the Medicaid expansion will address a cruel barrier to ending the AIDS crisis by allowing low-income people to qualify for Medicaid based on income alone. Today, a majority of low-income people with HIV are denied Medicaid coverage until after they become so sick that they are disabled.
- HIV infection disproportionately affects low-income people in the US. HIV rates in high poverty areas in the U.S. are comparable to those in Haiti, Angola, and Ethiopia. HIV prevalence rates are 7 times higher among individuals with incomes below $10,000 per year as compared to individuals with incomes greater than $50,000 per year.[iii]
- Nearly 50% of people with HIV/AIDS currently receiving medical care rely on Medicaid to access care and treatment.[iv]

Inadequate Access to Health Care Fuels HIV Health Disparities

- Today, only around 50% of people with HIV are in regular medical care and only 25% are being effectively treated with HIV medications. Around 13% of people living with HIV have private insurance coverage and nearly 25% are uninsured. This leads to deadly HIV health disparities.
- African Americans account for only 13% of the U.S. population but 46% of people living with HIV, and 64% of all women with HIV are African American. Gay men represent approximately 2% of the general population but 53% of new infections.
- The HIV prevalence rate for blacks is more than eight times the rate for whites. The rate for Hispanics is three times the rate for whites. The number of deaths due to HIV among blacks is eight times higher than it is for whites.

- Eight of ten states with the highest rates of new AIDS cases are in the South and 50% of new HIV cases are in the South – although the region represents only 37% of US population. Southern states also account for eight of the ten states with the highest death rates.[v]

The Medicaid Expansion is an Opportunity to Address these Health Disparities

- Medicaid improves access to health care for minorities. In one study, nearly 50% of uninsured black Americans did not have a regular source of health care compared to 7% of black Americans enrolled in Medicaid. Uninsured black Americans were four times more likely to go without a doctor's visit in the past year than black Americans on Medicaid.[vi]
- An evaluation of a Medicaid expansion in Oregon found that people newly covered by Medicaid were more financially stable than those that were uninsured. They also were 70% more likely to have a regular place for care and 55% more likely to have a regular doctor.[vii]

The Medicaid Expansion: Good for States and Their Most Vulnerable Residents

- States can't afford not to participate in the Medicaid expansion. On average the expansion will only cost states 2.8% more than they are spending now on Medicaid. The cost to states is likely to be much less because this estimate does not take into account savings states will realize from reduced spending on uncompensated care for uninsured individuals.
- The Medicaid expansion is almost completely paid for by the federal government. States receive 100% funding from the federal government from 2014 to 2016. The federal share gradually drops to 90% in 2020 where it remains. Even after 2020 – states only will be responsible for 10 cents of every $1 spent on the expansion population.
- More than 17 million low income, uninsured Americans stand to gain better access to health care if the Medicaid expansion is fully implemented. The poorest individuals and families will be left behind if any state does not comply with the Medicaid expansion because individuals and families with incomes less than 100% of the federal poverty level (around $11,000 per year for an individual) will not be eligible for subsidies to make coverage affordable.
- States in the southeastern U.S. with the highest rates of poverty and uninsured residents have the most to gain from the Medicaid expansion.[viii]
- Medicaid is a cost effective program. The costs per Medicaid beneficiary have not grown as fast as the costs in the private insurance market, and the average cost per beneficiary is lower than private coverage.[ix]
- The Children's Health Insurance Program and the Breast and Cervical Cancer Program are highly successful Medicaid expansions where all states elected to participate even without the nearly 100% federal support offered by the ACA.

States at Risk

- The federal government has not released a formal process or timeline for states to declare whether they will comply with the ACA's Medicaid expansion. A number of state leaders have indicated in the media that they plan to reject the Medicaid expansion, ***but no final actions have been taken***.
- Twenty six states joined the law suit challenging the Medicaid expansion, and these states may be more likely to refuse to comply with the Medicaid expansion. See if your state is on the list and how many people could be affected: http://www.kaiserhealthnews.org/Stories/2012/June/29/state-medicaid-program-growth-chart.aspx.
- The 2012 elections matter. State and federal policymakers must be held accountable for providing reliable access to comprehensive health care for the poorest residents – including many people with HIV/AIDS.

July 2012

Who Are Our Allies?

- States that opt not to expand Medicaid will be leaving a wide swath of vulnerable populations out of reform. HIV advocates should join coalitions of other low-income advocates in their state to make the case for why the state should expand Medicaid in 2014.
- Hospitals, federally qualified health centers and insurance companies that pay for billions of dollars in uncompensated care to large numbers of uninsured people have much to gain from the Medicaid expansion. State hospital associations, provider groups, and insurance companies will be important allies in ensuring that state decision makers understand the economic and public health impact of a decision to forgo the Medicaid expansion.

Resources to Learn More and Stay Informed

- HIV Health Reform - www.hivhealthreform.org
- Treatment Access Expansion Project – www.taepusa.org
- Kaiser Family Foundation – www. http://healthreform.kff.org/ and http://www.statehealthfacts.org
- Center on Budget and Policy Priorities – www.cbpp.org
- National Health Law Program— http://www.healthlaw.org/
- FamiliesUSA – http://www.familiesusa.org/
- American Public Health Association – http://www.apha.org/advocacy/reports/webinars/

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[i] Nat'l Federation of Ind. Business v. Sebelius, 597 US _ , 55 (2012).

[ii] Myron CS et al, Prevention of HIV-1 infection with early antiretroviral therapy. *N. Eng. J. Med.* 2011;365:493-505.

[iii] See Centers for Disease Control and Prevention. Communities in Crisis: Is There a Generalized HIV Epidemic in Impoverished Urban Areas of the United States? 2010. Online at http://www.cdc.gov/hiv/topics/surveillance/resources/other/poverty.htm.

[iv] Kates, J. Medicaid and HIV: A National Analysis. 2011. Online at: http://www.kff.org/hivaids/upload/8218.pdf.

[v] Southern HIV/AIDS Strategy Initiative. HIV/AIDS in the South Reaches Crisis Proportion in the Last Decade. 2012. Online at: http://www.scribd.com/doc/78789145/Southern-AIDS-Research-Report-Final.

[vi] Kaiser Family Foundation. Medicaid's Role for Black Americans. 2011. Online at: http://www.kff.org/medicaid/upload/8188.pdf

[vii] Baicker, K and A. Finkelstein. The Effects of Medicaid Coverage—Learning from the Oregon Experiment. N Engl J Med. Aug. 25, 2011.

[viii] Kaiser Family Foundation. Medicaid Coverage and Spending in Health Reform. Online at http://www.kff.org/healthreform/upload/medicaid-coverage-and-spending-in-health-reform-national-and-state-by-state-results-for-adults-at-or-below-133-fpl.pdf.

[ix] Center on Budget and Policy Priorities. Medicaid Block Grant or Funding Caps Would Shift Costs to States, Beneficiaries, and Providers. 2011. Online at: http://www.cbpp.org/cms/index.cfm?fa=view&id=3363

Developed in conjunction with the HIV Health Care Access Working Group – a coalition of more than 100 national and community-based HIV service organizations committed to ensuring access to critical HIV-related health care and support services. For more information contact the Co-chairs Robert Greenwald with the Treatment Access Expansion Project at rgreenwa@law.harvard.edu or Andrea Weddle of the HIV Medicine Association at aweddle@hivma.org

July 2012

THE LANCET

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The Lancet, Volume 380, Issue 9839, Pages 411 - 423, 28 July 2012
doi:10.1016/S0140-6736(12)60722-3

This article can be found in the following collections: Public Health; Global Health; Infectious Diseases (HIV/AIDS)
Published Online: 20 July 2012

Common roots: a contextual review of HIV epidemics in black men who have sex with men across the African diaspora

Gregorio A Millett MPH [a], William L Jeffries PhD [a], Prof John L Peterson PhD [b], David J Malebranche MD [c], Tim Lane PhD [d], Stephen A Flores PhD [a], Kevin A Fenton MD [a], Patrick A Wilson PhD [e], Riley Steiner MPH [a], Charles M Heilig PhD [a]

Summary

Pooled estimates from across the African diaspora show that black men who have sex with men (MSM) are 15 times more likely to be HIV positive compared with general populations and 8·5 times more likely compared with black populations. Disparities in the prevalence of HIV infection are greater in African and Caribbean countries that criminalise homosexual activity than in those that do not criminalise such behaviour. With the exception of US and African epidemiological studies, most studies of black MSM mainly focus on outcomes associated with HIV behavioural risk rather than on prevalence, incidence, or undiagnosed infection. Nevertheless, black MSM across the African diaspora share common experiences such as discrimination, cultural norms valuing masculinity, concerns about confidentiality during HIV testing or treatment, low access to HIV drugs, threats of violence or incarceration, and few targeted HIV prevention resources.

This is the fifth in a **Series** of six papers about HIV in men who have sex with men

Introduction

Various studies during the past decade have assessed the severity of HIV epidemics in men who have sex with men (MSM) in low-income and middle-income countries.[1], [2] Some of these efforts have characterised the extent to which black MSM are disproportionately affected by HIV,[3–6] but none provides a comprehensive overview of HIV epidemics in black MSM worldwide.

In this fifth paper of *The Lancet* HIV in MSM Series, first we examine the epidemiological data for HIV infection in black MSM across the African diaspora (panel 1) and the extent to which these men report access to HIV prevention and care services. Second, we investigate common findings across studies and reports of black MSM worldwide and assess whether these findings are associated with increased susceptibility to HIV infection. Third, we examine genetic and biological explanations for disproportionate rates of HIV infection in black communities compared with other populations. Finally, we use meta-analytic methods to assess differences in the prevalence of HIV infection between black MSM and general populations, including disparities between African and Caribbean countries with and without homosexuality criminalisation policies.

Panel 1
Diaspora

The word diaspora has most commonly been used to describe the dispersal of people of Jewish descent outside Palestine and the Middle East. Over the past two decades, the definition has expanded to describe communities of people living outside their ancestral homelands or people with a common affiliation who are scattered around the world. By this expanded definition, there are Irish, Armenian, and Indian diasporas, including the diasporic experiences of many other racial, ethnic, religious, or other populations.

The African diaspora is the resettlement of people of African descent to the Americas, the Caribbean, Europe, Asia, Australasia, or the Middle East. Although this diaspora has its basis in the slave trade that lasted from the 16th to the 19th century, it also includes more recent migrations of people of African descent from Africa or the Caribbean to the Americas, Europe, the Middle East, Asia, and other parts of the world.

Key messages

- Black MSM are at greater risk for HIV infection than are general populations across much of the African diaspora
- Policies that criminalise homosexuality in the Caribbean are associated with increased prevalence of HIV infection in black MSM
- Regular access to safe and culturally competent HIV care is not available to black MSM across the diaspora
- HIV prevention programmes do not always target black MSM, and investments in HIV prevention in black MSM are underfunded
- Structural interventions to address poverty or reduce discrimination (eg, homophobia, AIDS stigma, racism) in health-care systems and beyond are necessary to decrease the disproportionate prevalence of HIV infection in black MSM

Epidemiology

Findings from various epidemiological studies show that the prevalence of HIV infection in black MSM is similar to or greater than that in general populations around the world (table 1). The 71 studies listed in table 1 (citations in appendix), representing 129 976 black MSM, vary by sample size, methodological rigour, determination of HIV status, and recruitment method. In countries such as the USA, Ghana, South Africa, and Kenya, the incidence of HIV infection is higher in MSM than in all other demographic groups.[7–9] Although data are insufficient to establish whether black MSM account for most diagnoses of HIV infection in MSM for some Caribbean countries, HIV surveillance data show a disproportionate prevalence in people of African descent from the Caribbean.[10]

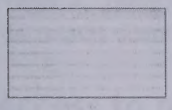

Table 1 Table image
Prevalence of HIV infection in black MSM compared with that in general populations in Africa, the Caribbean, Europe, and North America, 1980–2011

To assess quantitatively the effect of HIV in black MSM in various regions and countries, we calculated summary HIV prevalence ratios for the data presented in table 1 (methods published previously[1] and summarised in the appendix) and noted that prevalence across studies of black MSM worldwide is 15 times higher than that in general populations. The odds of being infected with HIV are roughly 72 times higher in black MSM than in general populations in the USA (odds ratio [OR] 72·1, 95% CI 64·9–80·1; number of effect sizes [k]=7) and Canada (72·6, 34·2–154·0; 3), and more than 100 times higher in black MSM than in general populations in the UK (111·4, 85·4–145·2; 10).

Additionally, the prevalence of HIV infection is 8·5 times higher in black MSM than in black populations across the diaspora and, with the exception of southern African countries, this disparity persists across many regions (figure 1). The summary

ratios of the prevalence in black MSM compared with that in black populations by country increase linearly by income level from low to high income, with a significant difference in the ORs for high-income compared with middle-income or low-income countries.

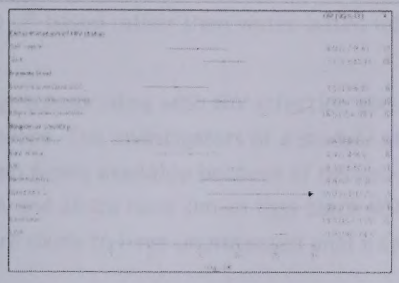

Figure 1 Full-size image (14K) Download to PowerPoint
HIV prevalence disparities between black MSM and general black populations across the African diaspora
Summary odd ratios represent data from random effects models. Estimates based on available data for each region or country. MSM=men who have sex with men. OR=odds ratio. k=number of effect sizes. Sources of general population census data are given in the appendix.

The disparity between black MSM and general black populations is greater for studies that used diagnostic tests than for those that used self-reporting to establish HIV status (figure 1).

Few correlates of HIV infection are consistent in black MSM worldwide (table 2). Diverse correlates have been examined in one or more regions, and include well-known factors (eg, sex and drug risk behaviours, diagnosis of sexually transmitted infections [STIs], increasing age) and others (eg, incarceration, homelessness, blackmail). Some correlates (eg, alcohol use, incarceration, sex work, circumcision) are associated with HIV infection in one region but not in others. Most correlates of HIV infection have been examined in African and US studies, with some shared across both regions (eg, gay identity [*vs* heterosexual or bixsexual identity], homosexual [*vs* bisexual] behaviour, increasing age, low income, mixed-race ancestry, sexual abuse).

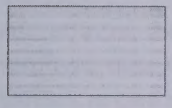

Table 2 Table image
Correlates quantitatively associated with HIV infection in studies of black MSM across the African diaspora, 1980–2011

Access to prevention services

Black MSM report various barriers to access to HIV prevention services. The results of a British survey[11] showed that black MSM were less likely to have received free condoms or lubricants in the previous month than were other MSM. Investigators of a study[12] done in Chicago noted that few HIV prevention services for MSM were located in the south of the city, where most black MSM reside (and who accounted for most new cases of HIV infection). Access to prevention services is also an issue in South Africa, where black MSM are less likely to be tested for HIV infection than are white MSM.[13] In the Caribbean, less than 40% of MSM are reached by prevention programmes,[14] which is consistent with UNAIDS[15] data showing that as many as 52% of Bahamian and 83% of Guyanese MSM were not reached by such programmes.

Poor access to prevention materials complicates HIV prevention efforts. According to a study by Zulu and colleagues,[16] 73% of Zambian MSM believed that anal sex was safer than vaginal sex. Meanwhile 86% of black MSM in a Lesotho study[17] did not know that receptive anal sex was a risk factor for HIV transmission or that water-based lubricants should be used with latex condoms.[17] Inadequate access to HIV prevention materials and non-participation in HIV prevention programmes were

associated with unprotected anal intercourse in MSM in investigations in Cameroon, Senegal, and Kenya.[18–20] Kenyan male sex workers who reported sex with men and who did not know that unprotected anal intercourse was a risk factor for HIV transmission were more likely to have such intercourse than were those who were aware of this risk.[20] Furthermore, only 21% of participants knew to use water-based lubricants with latex condoms (29% used no lubrication with latex condoms and 36% used an oil-based lubricant). The results of other studies[21], [22] have also shown that black African MSM are more likely to use oil-based rather than water-based lubrication, increasing the probability of condom degradation and failure.

Stigma associated with HIV infection and conspiracy beliefs (eg, that HIV is manmade) can also impede access to prevention services. The investigators of a study[23] of Jamaican MSM reported that participants were reluctant to obtain lubricants even when freely available because of pervasive stigma associating lubricant use with homosexual anal sex; reports from both the USA and Africa have shown that black MSM who hold HIV conspiracy beliefs are less likely to access HIV testing services and more likely to have unprotected anal intercourse than are black MSM who do not hold such beliefs.[24], [25]

Access to care services

In a US study, black MSM were more likely than white or Hispanic MSM to be diagnosed later (ie, to have <200 CD4 cells per μL at diagnosis), and to suffer worse health outcomes.[26] Similarly, in the UK between 2004 and 2008, 24% of black Caribbean and 30% of black African MSM diagnosed with HIV infection had fewer than 200 CD4 cells per μL compared with 21% of white MSM.[27] High proportions of late-stage diagnoses both in MSM and in black populations have also been reported in Canada.[28], [29]

Unrecognised HIV infection is associated with late diagnosis. 26–28% of black MSM in US and African studies had undiagnosed HIV infection,[30], [31] and black MSM in the UK are estimated to be four times more likely than white MSM to have undiagnosed HIV infection.[32] Late diagnoses and undiagnosed HIV infection are associated with greater HIV transmission opportunities than are early-diagnosed cases, which could explain the disproportionate rates of HIV infection in black compared with other MSM.

Although combination antiretroviral therapy substantially improves health outcomes and reduces the risk of HIV transmission,[33] black MSM are less likely than are white MSM to access it in the USA and the UK. The results of two meta-analyses[34], [35] 5 years apart showed that in the USA, HIV-positive black MSM are less likely to access combination antiretroviral therapy than are other HIV-positive MSM. Delayed access to antiretroviral therapy in black MSM in the UK is surprising since the UK provides universal health care to residents, but immigration status has been identified as one of many barriers to care and treatment.[36] Access to combination antiretroviral therapy is also poor in the Caribbean and Africa. Although not specific to black MSM, only 48% of people infected with HIV in the Caribbean were estimated to be taking combination antiretroviral therapy in 2011.[37] The investigators of a study[38] done in Malawi, Namibia, and Botswana noted that only 4·3% of HIV-positive MSM reported access to treatment.[38]

A US meta-analysis showed that black MSM are less likely to adhere to combination antiretroviral therapy than are MSM of other ethnic origins.[35] Similar patterns have been reported in the UK, but the differences were not significant.[39] In Kenya and Senegal, unexpected treatment interruptions when HIV-positive black MSM and their health-care providers are arrested for homosexuality offences contribute to non-adherence.[40], [41]

Several qualitative reports[42], [43] about black MSM in the USA have shown negative encounters with medical personnel. US black MSM are less likely than other MSM to disclose same-sex behaviour to health-care providers.[44] Non-disclosure to health-care providers is associated with mistrust of health systems generally,[45] and such mistrust in black MSM is associated with avoidance of testing[24] and poor adherence to treatment.[46] In UK studies, nearly one in five black MSM were concerned about disclosing their same-sex behaviour to health-care providers because they feared breaches of confidentiality.[47] Similar concerns have been reported by black MSM in Canada,[48] the USA,[42] and Kenya.[49] A study of people living with HIV/AIDS in Grenada and Trinidad and Tobago showed that stigma and uncomfortable interactions with health-care providers were common, especially when health-care providers perceived patients to be MSM.[50] Similarly, in Malawi, Namibia, and

Botswana, disclosure of gay identity or same-sex behaviour to health-care providers was associated with being denied health care and being asked for bribes to keep such disclosures secret.[38]

Cultural competency of health-care providers is an additional barrier to care. African and Caribbean MSM living in Canada and the UK report an absence of culturally competent health-care services, and people from both groups complain that health-care providers do not recognise cultural differences between and within these communities.[27, 51] Respondents to a qualitative study in Antigua reported that only one provider on the island would accept MSM as patients.[52] In Nigeria, less than 20% of black MSM reported that they had received HIV-related information from health-care workers,[53] and black MSM in South Africa,[54] Senegal,[40] and Jamaica[55] have avoided or delayed seeking care after experience of homophobic comments from health-care workers.

Gender role and sexual identity

Pressure to conform to prevailing norms of gender and masculinity is widely reported by black MSM across the diaspora.[4,56–58] In Port-au-Prince, Haiti—where HIV prevention services for MSM were destroyed by the 2010 earthquake—some black MSM adopted a more masculine manner than usual to avoid harassment and gain access to emergency services.[59] In a Jamaican qualitative study, some black MSM said that they blamed effeminate MSM for fuelling societal homophobia.[60]

Partly because of societal discrimination, many black MSM who also have sex with women keep their homosexual behaviour private.[6, 20, 61, 62] Meta-analyses have shown that US black MSM are much less likely than are other MSM to identify as gay.[34, 35] Similarly, black MSM in studies in the UK,[63] Jamaica,[62] and South Africa[64] were less likely to identify as gay than were MSM of other ethnic backgrounds, and qualitative investigations have shown that black MSM associate the term gay with emasculation or being the receptive partner during anal sex.[42] However, the results of studies[65–67] from the USA, the Caribbean, and Africa have shown that men who do not identify as gay or exclusively homosexual are less likely to be infected with HIV than are MSM who identify as gay or men who are exclusively homosexually active.

Homophobia

Population-based surveys show that most black Americans,[68] black Jamaicans,[69] and black Africans deem homosexuality immoral.[70] Homosexuality is viewed as a white man's disease in black heterosexual communities across the diaspora, and conservative religious perspectives fuel antipathy to homosexuality.[54,60,71–73] In African politics, homosexuality is frequently portrayed as a European colonial corruption or a manifestation of witchcraft,[74] or it is used as an insult to disparage a political rival.[75] Such homophobic attitudes can hinder research; African institutional review boards have delayed approval of MSM-specific protocols because of perceptions that MSM do not exist.[74] Homophobia restricts availability of health care for MSM in Africa and the Caribbean. In a study based in Mombasa, Kenya,[20] only 22% of MSM reported ever attending a clinic sympathetic to MSM, and researchers have noted that some black Caribbean and African MSM explain away the presence of rectal STIs or forego treatment altogether because of stigma.[49, 52] Even in South Africa, where the constitution prohibits discrimination against sexual minorities, only 49% of black MSM in one study who were diagnosed with or had symptoms of an STI in the previous year felt comfortable seeking treatment.[54]

In Kenya, black MSM who experienced anti-gay stigma were more likely to have unprotected anal intercourse and be HIV positive than were black MSM who hadn't experienced anti-gay stigma.[76] In the USA, experience of homophobia by HIV-positive black MSM doubled the odds of unprotected anal intercourse with male partners who were HIV negative or of unknown HIV status.[77] The results of other US studies have shown that black MSM are more likely than are other MSM to believe that homosexuality is immoral[68]—leading to less HIV testing in those who are HIV negative[68] and missed clinical visits by those who are HIV positive.[78] In another US study, low social support—a possible consequence of homophobia—reduced the likelihood of HIV testing and increased the likelihood of undiagnosed HIV infection in black and hispanic MSM.[79]

Criminalisation

Same-sex behaviour is criminalised in 38 African and 10 Caribbean countries.[70] In some countries, homosexuality is punishable by lengthy prison terms or death. Well publicised examples of state-sanctioned homophobia include the arrest and conviction in 2010 of two Malawian men who married one another,[80] several accounts of intimidation of and violence against gay men in Jamaica,[55] the 2011 murder of Ugandan gay-rights activist David Kato,[81] and threats by the Gambian President Yahya Jammeh to decapitate homosexuals.[82] Law enforcement officials in Africa and the Caribbean routinely ignore or participate in anti-gay violence, [55, 83] and local media publish photographs, names, and addresses of homosexual men, making them targets for abuse.[74, 84] Additionally, in Uganda and Nigeria the lives of people providing health-care services are jeopardised if they do not report people who have disclosed same-sex behaviour.[85, 86]

Homophobic violence is also prevalent in developed countries. Verbal abuse and physical violence towards black MSM have been recorded in Canada[72] and the UK,[6] and murders of black African MSM by their families in the UK have been reported.[87] According to data from the US Department of Justice,[88] homophobic violence in the USA is second only to racially motivated assaults as the most common type of bias-related assault, and high-profile murders of black MSM have been reported in the national news.[89, 90]

We combined data from table 1 with information about same-sex criminalisation statutes by country[70] to examine disparities in the prevalence of HIV infection in black MSM in Africa and the Caribbean by same-sex criminalisation status. The odds of HIV infection in black MSM relative to general populations were nearly two times higher in African and Caribbean countries that criminalise homosexual activity than for those living in countries where homosexual behaviour is legal (OR 7·8, 95% CI 5·1–11·9; k=34 *vs* 4·8, 2·4–9·7; 11). The odds of being infected with HIV are significantly greater in Caribbean countries that criminalise homosexual sex than in those where such behaviour is legal (figure 2). Although the ORs did not differ significantly, disparities in HIV prevalence between black MSM and general populations were two times greater in African and Caribbean countries where punishments for homosexual behaviour are severe (ie, 25 or more years in prison or the death sentence) than in those where homosexual sex is not criminalised (figure 2).

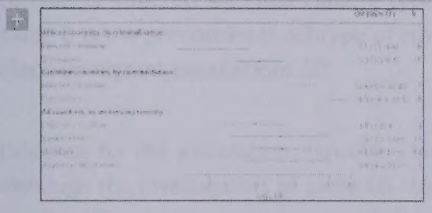

Figure 2 Full-size image (12K) Download to PowerPoint
Criminalisation of homosexual activity and disparities in HIV prevalence between black MSM and general populations in African and Caribbean countries
Summary odds ratios represent data from random effects models. Estimates based on available data for each country or region. *Includes all African and Caribbean countries with data to compute effect sizes. MSM=men who have sex with men. OR=odds ratio. k=number of effect sizes. General population census data drawn from World Bank and general population HIV prevalence data drawn from UNAIDS.

Racism

Institutionalised racism and curtailed employment, housing, education, and health opportunities have been reported by black MSM in the USA, Canada, and the UK.[6, 72, 91] Black MSM in each country have experienced racial discrimination from white lesbian, gay, bisexual, and transgender (LGBT) communities. UK black MSM in one investigation[6] experienced racism more often than homophobia; 57% of black MSM in the study had experienced racism from the white LGBT community. Ethnographic research studies from the Caribbean,[56] Brazil,[92] Canada,[72] South Africa,[93] and the USA had similar findings.[91]

Although no direct associations between racism and HIV infection have been reported, racism increases the risk of HIV transmission for black MSM through partner selection (eg, by necessitating them to make partner choices within communities with a high prevalence of HIV infection),[94] poverty,[35] and access to health care.[35] Furthermore, racism contributes to disparate incarceration rates between black and white MSM in the USA and Canada;[95], [96] imprisonment decreases the likelihood of virological suppression,[97] linkage to care after release from custody,[98] and detection of undiagnosed HIV infection[99] in people infected with HIV.

Financial factors

A meta-analysis[35] showed that, compared with white MSM, US black MSM had 229% and Canadian black MSM 56% greater odds of having low incomes.[35] Similar racial disparities are reported for MSM in the UK.[100] Low income increases the likelihood of HIV risk behaviours,[3] and studies of black MSM in the USA and Africa have shown associations between low income and being HIV positive[65], [101] and inability to afford health care.[102] Low income is also associated with food insecurity in both low-income and high-income countries, which is linked to poor clinical outcomes for people living with HIV.[103], [104] In the USA, low income and black ethnic origin are both independently associated with high mortality rates in people infected with HIV, even since the introduction of combination antiretroviral therapy.[105] More importantly, HIV prevention programmes targeting black MSM are systematically underfunded in the USA, the Caribbean, and Africa despite the proportion of infections that black MSM represent (appendix).[106], [107]

Sexual networks and partner characteristics

Evidence from across the diaspora shows that black MSM tend to choose black men as partners. Black MSM in the USA are 11·5 times more likely than white MSM to have black sex partners.[35] In a Canadian study,[4] black men had sex with more black (73%) than white (53%) or other race (36%) male partners—a larger than expected proportion of same-race partnerships since black people account for only 2·5% of the Canadian population. Doerner and colleagues' large UK study[108] showed that, although most black or south Asian MSM reported male casual-sex partners of other ethnic origins (63% and 72%, respectively), both black and south Asian MSM each reported more same-race partners than would be expected by chance alone. These data are supported by phylogenetic analyses in another UK study, which showed that black MSM were more commonly infected with non-clade-B type HIV-1 infection than were non-black MSM, which is an important finding because clade B is the predominant subtype of HIV-1 infection in white MSM in the UK, whereas non-clade-B types predominate in black immigrant populations.[109]

Evidence for the association, however, between having black sex partners and HIV infection in black MSM is inconsistent. Although the investigators of some US studies have reported that black MSM with black partners are more likely to be HIV positive[110] or to have unrecognised HIV infection than are those who did not have black partners,[67] other US studies have not shown this association nor increased odds of black MSM having unprotected anal intercourse with other black partners.[111] Despite inconsistent findings for infection risk and same-race partnerships in black MSM, the high background prevalence of HIV infection in black MSM communities compared with other MSM communities increases HIV transmission in black MSM.[34]

Prevalence of HIV infection is higher in older than in younger MSM and thus black MSM with older partners are at greater risk than are those with younger partners.[110] In our meta-analysis,[35] US black MSM report earlier first sexual experiences and older sex partners than do other MSM. In a Brazilian study, Moutinho[112] reported that young black MSM in Brazil are commonly paid for homosexual sex with older white tourists. A study of Jamaican MSM aged 15–24 years showed that 75% had male partners who were 5 or more years older than themselves, with 57% reporting unprotected anal intercourse with older partners.[113] These findings are important because age-discordant sex is associated with HIV seropositivity in young black MSM.[110], [114]

US black MSM are more likely than are other US MSM to report sex work but, unlike studies of MSM in Africa,[115] sex work has not been associated with HIV infection in black MSM in the USA. The role of sex tourism in fuelling local epidemics is unclear.

Although sex tourism has been linked to the global and local HIV epidemics in Caribbean and African black MSM,[115, 116] the results of both survey research and HIV phylogenetic studies show that black MSM in low-income and middle-income countries largely choose one another as sex partners rather than outsiders.[5, 74, 116, 117]

Genetic and biological susceptibility

Genetic and biological factors increase the risk of HIV transmission in MSM generally,[118] and they might also raise the risk of HIV infection in black populations. Although more work is needed to elucidate the interaction of these genetic and biological factors with social and behavioural drivers of HIV infection, some research has explored whether black populations (and by extension black MSM) have greater biological susceptibility to HIV infection than do non-black populations.

Circumcision, a cultural practice with biological consequences, reduces the odds of HIV acquisition in heterosexual men. Three studies[65, 119, 120] have examined the role of male circumcision in HIV infection in black MSM; although one study showed a protective effect, the results of the other two showed little evidence of a protective effect overall—a finding confirmed by two meta-analyses[121, 122] of available MSM studies irrespective of race.

US and UK black MSM have a 208% and 62%, respectively, greater odds of having a viral STI than do other MSM,[35] and in a study in Quebec, Canada, black MSM had a greater lifetime prevalence of syphilis or herpes diagnoses than did other MSM (Demers E, Université Laval, personal communication). Wade and colleagues[123] reported that 22·3% of Senegalese MSM were infected with herpes simplex virus type 2. In a study of Kenyan MSM, 92% of diagnosed STIs were subclinical.[124] Because infection with ulcerative STIs (eg, infection with herpes simplex virus type 2, syphilis) substantially increases HIV susceptibility and transmissibility, STI morbidity partly drives infection disparities between black and other MSM globally.[125]

Perhaps the most-studied host genetic factor affecting susceptibility to HIV infection is the Δ32 allele variant of the chemokine receptor type 5 (CCR5), which is the main co-receptor expressed on the surface of CD4 cells to which the virus attaches during infection. The presence of this mutation (heterozygous or homozygous) can reduce susceptibility to HIV infection and delay progression to AIDS in HIV-positive individuals; it is more common in individuals of European descent than in those of other ethnic origins.[126] However, in a study in Malawi no associations between genetic variants of CCR5 and HIV susceptibility or protection were apparent.[127]

Other host genetic factors could have a role in susceptibility to HIV acquisition. Chemokine (C–C motif) ligand 3-like 1 (CCL3L1), an immunosuppressive ligand that binds to CCR5 on CD4 cells, reduces susceptibility to HIV infection.[128] Racial variations in the prevalence of CCL3L1 and interactions with mutations of CCR5 could affect cell-mediated immunity in black populations.[128] Furthermore, the Duffy antigen receptor for chemokines might heighten susceptibility to HIV infection in black populations.[129] In a small study of MSM, concentrations of α4β7 proteins—facilitators of cell-to-cell transmission of HIV—on CD4 cells were increased in black compared with white HIV-positive seroconverters; investigators postulated that the increased HIV transmission in black MSM could be because of the greater frequency and density of these cells in the rectal cavity.[130] Drug resistance is a potential contributor to disparities in HIV prevalence, especially because HIV-positive black MSM are less likely to be virally suppressed than are other MSM; however, the prevalence of infection with drug-resistant HIV in black MSM across the diaspora varies.[131–133]

Despite this apparent increased genetic variability and susceptibility to HIV infection in black populations worldwide, Rosenberg and colleagues[134] noted that most (roughly 75%) genetic studies have been done in European populations rather than in black or African populations across the diaspora, underscoring how much work remains to be done.

Conclusion

Despite many reports of disproportionate infection rates, HIV surveillance gaps still exist for black MSM across the diaspora. HIV-related epidemiological studies in the UK and Canada routinely group MSM together, irrespective of race, while explicitly

defining HIV infection in black people as heterosexual. Similarly, many European countries (eg, France, Spain, Germany) do not report HIV/AIDS data by race or ethnic origin. In the Caribbean, data on black MSM are sparse even though it is the second most affected region by the global HIV epidemic. Furthermore, surveillance data for black MSM in various Latin American countries with large black populations (eg, Colombia) are not available.

Our review is not without limitations. We have insufficient space to discuss the full breadth or depth of topics associated with HIV epidemics in black MSM worldwide. Black MSM populations are not homogeneous within or across countries, and although our review emphasises similarities, the differences should be fully explored in future reviews. The data in our review cover only countries for which information is available; HIV surveillance data for black MSM populations in parts of Africa, Latin America, the Caribbean, and Europe are lacking. Many of the studies listed in table 1 are derived from non-probability-based samples and their results cannot be generalised beyond black MSM within those particular investigations. The comparisons of population data with cross-sectional studies of black MSM should be interpreted with caution in the absence of adequate population-based assessments of MSM communities. Meta-analyses are subject to the biases of the selected studies, which should be considered in the interpretation of the results. Finally, HIV prevalence data for MSM in countries that criminalise homosexuality are confounded by other factors (eg, the subset of countries with available data for analyses), which limits inferences that can be made from the reported associations.

Our review establishes that black MSM are disproportionately affected by HIV infection worldwide and that these disparities are partly rooted in social inequalities, insufficient funding, ill-informed policies, and pervasive stigma and discrimination. Leadership, action, and commitment (panel 2) are required to address these social issues to reduce HIV infection disparities and to improve conditions for black MSM across the diaspora.

Panel 2
Recommendations

- Ensure that resources allocated to targeting of black men who have sex with men (MSM) are proportionate to their role in HIV epidemics
- Remove policies worldwide that exacerbate HIV transmission, stigma, or discrimination in black MSM
- Train law enforcement officials to recognise, interrupt, report, and prosecute attacks against MSM in Caribbean and African countries
- Encourage European, Central American, and South American countries to stratify HIV surveillance data in MSM by race and hold global and regional meetings to share promising research and programmes
- Provide basic access to condoms and water-based lubrication and increase the number of health-care providers and health centres that can provide culturally competent care for black MSM
- Design studies that emphasise protective factors (individual and community strengths) against HIV infection and interventions that mitigate or neutralise structural (eg, anti-gay violence, low income, discrimination) factors associated with HIV transmission risk

Search strategy and selection criteria

We searched PubMed, Medline, and Google Scholar for our systematic review and meta-analysis for papers published in English, Spanish, or French between Jan 1, 1981, and Dec 31, 2011, with the search terms "men who have sex with men", "MSM", "gay and bisexual men", "homosexual", "HIV", "AIDS", "black", "Africa", "Caribbean", "Europe", "United Kingdom", "Canada", "prevention services", "HIV test", "HIV risk", "condoms", "lubricant", "healthcare access", "antiretroviral therapy", "criminalization", "stigma", "homophobia", "racism", "discrimination", "diaspora", "income", "HIV resistance", 'circumcision", "masculinity", "gender role", and "STI/STD". We also searched for relevant reports from conference proceedings. We identified additional reports from reference lists of selected papers, so-called grey literature, and recommendations forwarded by colleagues, and solicited investigators for additional information (appendix).

Contributors

GAM did the systematic review, compiled the global black MSM epidemiological data, wrote a narrative for black MSM Caribbean data, and created each of the sections and the tables. WLJ wrote the first draft of the Caribbean data, proofread and revised earlier drafts of the report, provided substantive feedback on meta-analysis results, and helped to compile the reference list. JLP wrote the first draft of sociocultural factors associated with HIV infection in black MSM, proofread and revised earlier drafts of the paper, provided substantive feedback on meta-analyses results, and helped to compile, write, and revise the panels and appendix. DJM wrote the first drafts of the access to care and biology and genetics sections. TL wrote the first draft of the black African MSM section and proofread and revised earlier drafts of the paper. SF helped with the meta-analyses and checked the data. KAF wrote the draft section about UK black MSM. PAW compiled the data about black MSM in the Caribbean and provided data from the MSM Global Forum Survey. RS helped to write the draft UK black MSM section and provided feedback on the paper. CMH prepared the figures, and provided substantial feedback on the meta-analysis and earlier versions of the paper.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgments

We thank Steven Wakefield at Fred Hutchinson Cancer Center, Seattle; James Heffelfinger, Gabriel Paz-Bailey, Binh Le, and Teresa Finlayson at the Centers for Disease Control and Prevention Division of HIV/AIDS Prevention; George Ayala at the Global Forum on MSM and HIV; Michel Alary and Eric Demers at Laval University, Quebec; Ruben Del Prado and Michel de Groulard at UNAIDS; Jeffrey Crowley at Georgetown University; and Sonja Caffé at the Pan American Health Organization for graciously sharing data for the meta-analytic review; and Akeliah Robinson at the Gay Men's Health Crisis for providing comments on an earlier draft of the report. The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Supplementary Material

Supplementary appendix

PDF (229K)

References

1 Baral S, Sifakis F, Cleghorn F, Beyrer C. Elevated risk for HIV infection among men who have sex with men in low- and middle-income countries 2000–2006: a systematic review. *PLoS Med* 2007; **4**: e339. CrossRef | PubMed

2 Parker R, Khan S, Aggleton P. Conspicuous by their absence? Men who have sex with men (MSM) in developing countries: Implications for HIV prevention. *Crit Public Health* 1998; **8**: 329-346. PubMed

3 Millett GA, Malebranche D, Peterson JL. HIV/AIDS prevention research among black men who have sex with men: current progress and future directions on lesbian, gay, bisexual and transgender populations. New York: Springer, 2007.

4 Husbands W, Makoroka L, George C, et al. Mabwana: health, community and vulnerability to HIV among African, Caribbean and black gay and bisexual men in Toronto. Toronto: The African and Caribbean Council on HIV/AIDS in Ontario, 2008.

5 Smith AD, Tapsoba P, Peshu N, Sanders EJ, Jaffe HW. Men who have sex with men and HIV/AIDS in sub-Saharan Africa. *Lancet* 2009; **374**: 416-422. Summary | Full Text | PDF(104KB) | CrossRef | PubMed

6 Sylla J, Hodson M. The big update: the sexual health needs of black gay men and black men who have sex with men. http://www.gmfa.org.uk/londonservices/research/big-update.pdf. (accessed July 15, 2011)

7 Prejean J, Song R, Hernandez A, et al. Estimated HIV incidence in the United States, 2006–2009. *PLoS One* 2011; **6**: e17502. CrossRef | PubMed

8 Bosu W, Yeboah K, Gurumurthy R, Atuahene K. Modes of transmission in west Africa: Analysis of the distribution of new HIV infections in Ghana and recommendations for prevention. 2009. http://www.unaids.org/en/media/unaids/contentassets/documents/countryreport/2010/201003_MOT_West_Africa_en.pdf. (accessed Dec 8, 2011)

9 Price M, Rida W, Mwangome M, et al. Identifying at-risk populations in Kenya and South Africa: HIV incidence in cohorts of men who report sex with men, sex workers, and youth. *J Acquir Immune Defic Syndr* 2012; **59**: 185-193. CrossRef | PubMed

10 African and Black Diaspora Global Network on HIV and AIDS . HIV/AIDS impacts within the African and black diaspora: policy paper. http://www.abdgn.org/files/pdfs/ABDGN%20Policy%20Document.pdf. (accessed Nov 24, 2011)

11 Hickson F, Weatherburn P, Reid D, Jessup K, Hammond G. Testing targets: findings from the United Kingdom gay men's sex survey 2007. London: Sigma Research, 2009.

12 Pierce SJ, Miller RL, Morales MM, Forney J. Identifying HIV prevention service needs of African American men who have sex with men: an application of spatial analysis techniques to service planning. *J Public Health Manage Pract* 2007; **13** (suppl): S72-S79. PubMed

13 Sandfort TG, Nel J, Rich E, Reddy V, Yi H. HIV testing and self-reported HIV status in South African men who have sex with men: results from a community-based survey. *Sex Transm Infect* 2008; **84**: 425-429. CrossRef | PubMed

14 UNAIDS . Universal access in the Caribbean must include men who have sex with men. http://www.unaids.org/en/Resources/PressCentre/Featurestories/2010/March/20100316MSMCaribbean/. (accessed Oct 3, 2011)

15 UNAIDS . The status of HIV in the Caribbean. http://www.unaids.org/en/media/unaids/contentassets/documents/countryreport/2010/2010_HIVInCaribbean_en.pdf. (accessed Sept 29, 2011)

16 Zulu K, Bulawo NK, Zulu W. Understanding HIV risk behavior among men who have sex with men in Zambia. International AIDS Conference; Toronto, Canada; Aug 13–18, 2006. WEPE0719.

17 Baral S, Adams D, Lebona J, et al. A cross-sectional assessment of population demographics, HIV risks and human rights contexts among men who have sex with men in Lesotho. *J Int AIDS Soc* 2011; **14**: 36. PubMed

18 Henry E, Marcellin F, Yomb Y, et al. Factors associated with unprotected anal intercourse among men who have sex with men in Douala, Cameroon. *Sex Transm Infect* 2010; **86**: 136-140. CrossRef | PubMed

19 Larmarange J, Wade AS, Diop AK, et al. Men who have sex with men (MSM) and factors associated with not using a condom at last sexual intercourse with a man and with a woman in Senegal. *PLoS One* 2010; **5**: e13189. CrossRef | PubMed

20 Geibel S, Luchters S, King'Ola N, Esu-Williams E, Rinyiru A, Tun W. Factors associated with self-reported unprotected anal sex among male sex workers in Mombasa, Kenya. *Sex Transm Dis* 2008; **35**: 746-752. CrossRef | PubMed

21 Beyrer C. Epidemiology of HIV among MSM in Africa: implications for rectal microbicides. http://www.rectalmicrobicides.org/docs/Chris%20Beyrer%20MSM%20Africa%20microbicides.pdf. (accessed Sept 10, 2011)

22 Moreau A, Placide T, Abdoulaye L, Niang CI, Diop AK. Implementing STI/HIV prevention and care interventions for men who have sex with men in Senegal. Washington, DC: Population Council, 2007.

23 Willis KA. Role of the Jamaica Red Cross in providing safe space for MSM. https://www.2011caribbeanhivconference.org/abstract/role-jamaica-red-cross-providing-safe-space-msm. (accessed Sept 23, 2011).

24 Bogart L, Galvan F, Wagner G, Klein D. Longitudinal association of HIV conspiracy beliefs with sexual risk among black males living with HIV. *AIDS Behav* 2011; **15**: 1180-1186. CrossRef | PubMed

25 Tun W, Kellerman S, Maimane S, et al. HIV-related conspiracy beliefs and its relationships with HIV testing and unprotected sex among men who have sex with men in Tshwane (Pretoria), South Africa. *AIDS Care* 2012; **24**: 459-467. PubMed

26 Hall HI, Byers RH, Ling Q, Espinoza L. Racial/ethnic and age disparities in HIV prevalence and disease progression among men who have sex with men in the United States. *Am J Public Health* 2007; **97**: 1060-1066. CrossRef | PubMed

27 National Aids Trust . HIV and black Caribbean communities in the UK 2010. http://www.nat.org.uk/Media%20library/Files/Policy/2010/NAT%20black%20Caribbean%20report%20July%202010.pdf. (accessed March 23, 2010)

28 Krentz HB, Auld MC, Gill MJ. The high cost of medical care for patients who present late (CD4<200 cells/μL) with HIV infection. *HIV Med* 2004; **5**: 93-98. CrossRef | PubMed

29 Hall HI, Geduld J, Boulos D, et al. Epidemiology of HIV in the United States and Canada: current status and ongoing challenges. *J Acquir Immune Def Syndr* 2009; **51** (suppl 1): S13-S20. PubMed

30 Centers for Disease Control and Prevention . Prevalence and awareness of HIV infection among men who have sex with men—21 Cities, United States, 2008. *MMWR Morb Mortal Wkly Rep* 2010; **59**: 1201-1207. PubMed

31 Etiebet M, Akolo C, Iwu E, et al. High HIV-1 prevalence, risk behaviors, and viral loads in MSM enrolled in a community-based comprehensive HIV/AIDS clinic: Nigeria. Conference on Retroviruses and Opportunistic Infections; Seattle, WA, USA; Mar 5–8, 2011. 1104.

32 Walker K, Seaman SR, Angelis DD, et al. A synthesis of convenience survey and other data to estimate undiagnosed HIV infection among men who have sex with men in England and Wales. *Int J Epidemiol* 2011; **40**: 1358-1366. CrossRef | PubMed

33 Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *New Engl J Med* 2011; **365**: 493-505. PubMed

34 Millett GA, Flores SA, Peterson JL, Bakeman R. Explaining disparities in HIV infection among black and white men who have sex with men: a meta-analysis of HIV risk behaviors. *AIDS* 2007; **21**: 2083-2091. CrossRef | PubMed

35 Millett GA, Peterson JL, Flores SA, et al. Comparisons of disparities and risks of HIV infection in black and other men who have sex with men in Canada, UK, and USA: a meta-analysis. *Lancet* 2012. published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60899-X.

36 Prost A, Elford J, Imrie J, Petticrew M, Hart G. Social, behavioural, and intervention research among people of sub-Saharan African origin living with HIV in the UK and Europe: literature review and recommendations for intervention. *AIDS Behav* 2008; **12**: 170-194. CrossRef | PubMed

37 Brown I. HIV drug available to only 48% of people with disease in region. http://www.jamaicaobserver.com/news/HIV-drug-available-to-only-48-of-people-with-disease-in-region_10204240. (accessed Nov 19, 2011)

38 Baral S, Trapence G, Motimedi F, et al. HIV prevalence, risks for HIV infection, and human rights among men who have sex with men (MSM) in Malawi, Namibia, and Botswana. *PLoS One* 2009; **4**: e4997. CrossRef | PubMed

39 Cambiano V, Lampe FC, Rodger AJ, Smith CJ, Geretti AM, Lodwick RK. Long-term trends in adherence to antiretroviral therapy from start of HAART. *AIDS* 2010; **24**: 1153-1162. CrossRef | PubMed

40 Poteat T, Diouf D, Drame F, et al. HIV risk among MSM in Senegal: a qualitative rapid assessment of the impact of enforcing laws that criminalize same sex practices. *PLoS One* 2011; **6**: e28760. CrossRef | PubMed

41 Canning P. In Africa, will massive US HIV/AIDS funding start trickling to gay/MSM groups?. http://madikazemi.blogspot.com/2011/05/in-africa-will-massive-us-hivaids.html. (accessed Jan 9, 2012).

42 Malebranche DJ, Peterson JL, Fullilove RE, Stackhouse RW. Race and sexual identity: perceptions about medical culture and healthcare among black men who have sex with men. *J Nat Med Assoc* 2004; **96**: 97-107. PubMed

43 Wheeler DP. Working with positive men: HIV prevention with black men who have sex with men. *AIDS Ed Prev* 2005; **17** (1 suppl A): 102-115. PubMed

44 Petroll AE, Mosack KE. Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. *Sex Transm Dis* 2011; **38**: 63-67. CrossRef | PubMed

45 Hutchinson AB, Begley EB, Sullivan P, Clark HA, Boyett BC, Kellerman SE. Conspiracy beliefs and trust in information about HIV/AIDS among minority men who have sex with men. *J Acquir Immune Defic Syndr* 2007; **45**: 603-605. CrossRef | PubMed

46 Bogart L, Wagner G, Galvan F, Banks D. Conspiracy beliefs about HIV are related to antiretroviral treatment nonadherence among African American men with HIV. *J Acquir Immune Defic Syndr* 2010; **53**: 648-655. PubMed

47 Elford J, McKeown E, Nelson S, Anderson J, Low N. Use of sexual health services by ethnic minority men who have sex with men (MSM) in Britain. International Society for Sexually Transmitted Diseases Research. http://www.isstdr.org/BASSH%20Abstracts%20as%20at%2016%20November.pdf. (accessed Dec 22, 2011)

48 Myers T, Travers R, Allman D, Lau W, Maxwell J, Calzavara L. An HIV research needs assessment of MSM in ethno-cultural communities: perspectives of volunteers and service providers. Toronto, Canada: HIV Social, Behavioural and Epidemiological Studies Unit, University of Toronto, 2001.

49 Population Council . The overlooked epidemic: addressing HIV prevention and treatment among men who have sex with men in sub-Saharan Africa. http://www.popcouncil.org/pdfs/HIV_KenyaMSMMeetingReport.pdf. (accessed Feb 7, 2012)

50 Rutledge SE, Abell N, Padmore J, McCann TJ. AIDS stigma in health services in the eastern Caribbean. *Sociol Health Illness* 2009; **31**: 17-34. PubMed

51 Paparini S, Doyal L, Anderson J. 'I count myself as being in a different world': African gay and bisexual men living with HIV in London. An exploratory study. *AIDS Care* 2008; **20**: 601-615. CrossRef | PubMed

52 USAID . Men who have sex with men and HIV in the anglophone Caribbean: a situation review. http://www.aidstarone.com/focus_areas/prevention/resources/technical_briefs/MSM_HIV_Anglophone_Caribbean. (accessed Dec 9, 2011)

53 Merrigan M, Azeez A, Afolabi B, et al. HIV prevalence and risk behaviours among men having sex with men in Nigeria. *Sex Transm Infect* 2011; **87**: 65-70. CrossRef | PubMed

54 Rispel L, Metcalf C, Cloete A, Moorman J, Reddy V. You become afraid to tell them that you are gay: health service utilization by men who have sex with men in South African cities. *J Public Health Policy* 2011; **32** (suppl 1): S137-S151. CrossRef | PubMed

55 Human Rights Watch . Hated to death: homophobia, violence and Jamaica's HIV/AIDS epidemic. http://www.hrw.org/sites/default/files/reports/jamaica1104.pdf. (accessed Oct 19, 2011)

56 Malebranche DJ, Fields EL, Bryant LO, Harper SR. Masculine socialization and sexual risk behaviors among black men who have sex with men: a qualitative exploration. *Men Masc* 2009; **12**: 90-112. PubMed

57 Murray D. Between a rock and a hard place: the power and powerlessness of transnational narratives among gay Martinican men. *Am Anthropol* 2000; **102**: 261-270. PubMed

58 Weatherburn P, Hickson F, Reid D, Jessup K, Hammond G. Multiple chances: findings from the United Kingdom gay men's sex survey 2006. London: Sigma Research, 2008.

59 International Gay and Lesbian Human Rights Commission , Serovie . The impact of the earthquake, and relief and recovery programs on Haitian LGBT people. http://www.iglhrc.org/cgi-bin/iowa/article/publications/reportsandpublications/1369.html. (accessed March 25, 2012)

60 Joseph J, Cruickshank I, McKnight I, Chase M, Adomakoh S, Weller P. RSDU pilot series: "Judge the man in the mirror, before you judge me". Perceptions, experiences and impact of homophobia, stigma and violence among men who have sex with men (MSM) in two regions of Jamaica. https://www.2011caribbeanhivconference.org/abstract/rsdu-pilot-series-judge-man-mirror-you-judge-me-perceptions-experiences-and-impact-homophob. (accessed Dec 3, 2011).

61 Millett G, Malebranche D, Mason B, Spikes P. Focusing "down low": bisexual black men, HIV risk and heterosexual transmission. *J Nat Med Assoc* 2005; **97** (7 suppl): 52S-59S. PubMed

62 Figueroa JP, Duncan J, Byfield L, et al. A comprehensive response to the HIV/AIDS epidemic in Jamaica: a review of the past 20 years. *West Indian Med J* 2008; **57**: 562-576. PubMed

63 Elford J, McKeown E, Nelson S, Low N, Anderson J. Ethnicity, sexuality and sexual behaviour: a national study of men who have sex with men in Britain. http://www.isstdr.org/BASSH%20Abstracts%20as%20at%2016%20November.pdf. (accessed May 4, 2012)

64 Knox J, Sandfort T, Yi H, Reddy V, Maimane S. Social vulnerability and HIV testing among South African men who have sex with men. *Int J STD AIDS* 2011; **22**: 709-713. CrossRef | PubMed

65 Lane T, Raymond HF, Dladla S, et al. High HIV prevalence among men who have sex with men in Soweto, South Africa: results from the Soweto Men's Study. *AIDS Behav* 2011; **15**: 626-634. CrossRef | PubMed

66 Tabet SR, de Moya EA, Holmes KK, et al. Sexual behaviors and risk factors for HIV infection among men who have sex with men in the Dominican Republic. *AIDS* 1996; **10**: 201-206. CrossRef | PubMed

67 Maulsby C, Sifakis F, German D, Flynn C, Holtgrave D. Partner characteristics and undiagnosed HIV seropositivity among men who have sex with men only (MSMO) and men who have sex with men and women (MSMW) in Baltimore. *AIDS Behav* 2012; **16**: 543-553. CrossRef | PubMed

68 Glick S, Golden M. Persistence of racial differences in attitudes toward homosexuality in the United States. *J Acquir Immune Defic Syndr* 2010; **55**: 516-523. CrossRef | PubMed

69 Angus Reid Public Opinion . Jamaicans reject basic rights for homosexuals. http://www.angus-reid.com/polls/32592/jamaicans_reject_basic_rights_for_homosexuals/. (accessed Jan 3, 2012)

70 Ottoson D. State-sponsored homophobia: a world survey of laws prohibiting same sex activity between consenting adults. http://ilga.org/historic/Statehomophobia/ILGA_State_Sponsored_Homophobia_2009.pdf. (accessed Aug 10, 2011)

71 Lewis GB. Black-white differences in attitudes toward homosexuality and gay rights. *Public Opin Q* 2003; **67**: 59-78. CrossRef | PubMed

72 Black Coalition for AIDS Prevention . Visibly hidden: rethinking BMSM and HIV prevention. http://atwork.settlement.org/downloads/atwork/Visibly_Hidden_BMSM_HIV_Prevention_2007.pdf. (accessed Oct 25, 2011)

73 McKeown E, Nelson S, Anderson J, Low N, Elford J. Disclosure, discrimination and desire: experiences of black and south Asian gay men in Britain. *Cult Health Sex* 2010; **12**: 843-856. CrossRef | PubMed

74 Johnson CA. Off the map: how HIV/AIDS programming is failing same-sex practicing people in Africa. http://www.safaids.net/files/Off%20the%20Map.pdf. (accessed Aug 9, 2011)

75 Agence-France Presse . Zimbabwe MP 'detained for calling Mugabe gay.'. http://www.google.com/hostednews/afp/article/ALeqM5jLe0c7vlDeFthkjA7l5p7m_BDTpA?docId=CNG.8c00d88c207680afb79603ad03ccbd88.a81. (accessed Feb 5, 2012).

76 Onyango-Ouma W, Birungi H, Geibel S. Understanding the HIV/STI risks and prevention needs of men who have sex with men in Nairobi. Kenya: Population Council, 2005.

77 Jeffries WL, Marks G, Lauby J, Murrill CS, Millett GA. Homophobia is associated with sexual behavior that increases risk of acquiring and transmitting HIV infection among black men who have sex with men. *AIDS Behav* 201210.1007/s10461-012-0189-y. published online May 9. PubMed

78 Harper GW, Fernandez IM, Bruce D, Hosek SG, Jacobs RJ. The role of multiple identities in adherence to medical appointments among gay/bisexual male adolescents living with HIV. *AIDS Behav* 201110.1007/s10461-011-0071-3. published online Nov 1. PubMed

79 Lauby JL, Marks G, Bingham T, et al. Having supportive social relationships is associated with reduced risk of unrecognized HIV infection among black and Latino men who have sex with men. *AIDS Behav* 2012; **16**: 508-515. CrossRef | PubMed

80 BBC News . Malawi gay wedding couple lose bail appeal. http://news.bbc.co.uk/2/hi/africa/8439918.stm. (accessed Oct 22, 2011)

81 BBC News . Uganda gay rights activist David Kato killed. http://www.bbc.co.uk/news/world-africa-12295718. (accessed Oct 22, 2011)

82 Gambia News . President Jammeh gives ultimatum for homosexuals to leave. http://www.gambianow.com/news/print/1132.html. (accessed April 11, 2012).

83 Human Rights Watch . Criminalizing identities rights abuses in Cameroon based on sexual orientation and gender identity. http://www.hrw.org/sites/default/files/reports/cameroon1010web.pdf. (accessed Oct 15, 2011)

84 Muula A. Perceptions about men having sex with men in southern African country: case study of print media in Malawi. *Croat Med J* 2007; **48**: 398-404. PubMed

85 Mmali J. Uganda fear over gay death-penalty plans. http://news.bbc.co.uk/2/hi/africa/8412962.stm. (accessed Dec 9, 2011)

86 Fisher J. Nigerian leaders unite against same-sex marriages. http://www.bbc.co.uk/news/world-africa-15992099. (accessed Dec 9, 2011)

87 Traoré C. Debunking myths: a focus on African men who have sex with men. http://idoitright.co.uk/wp-content/uploads/2011/09/AHPNNewsletter-Debunking-myths-AfricanMSM-2007.pdf. (accessed Nov 10, 2011)

88 Federal Bureau of Investigation . Uniform crime report: hate crime statistics, 2009. Washington, DC: US Department of Justice, 2010.

89 Horswell C. Houston family lays gay, slain Navy sailor to rest. http://www.chron.com/news/houston-texas/article/Houston-family-lays-gay-slain-Navy-sailor-to-rest-1723280.php. (accessed Dec 5, 2011)

90 Severson K. Weighing race and hate in a Mississippi killing. http://www.nytimes.com/2011/08/23/us/23jackson.html?_r=1&pagewanted=all. (accessed Dec 5, 2011)

91 National Gay and Lesbian Task Force . Say it loud: I'm black and I'm proud. http://www.thetaskforce.org/downloads/reports/reports/SayItLoudBlackAndProud.pdf. (accessed Dec 9, 2011)

92 Pinho O. Desejo e poder: racismo e violência estrutural em comunidades homossexuais. http://redeafrolgbt.blogspot.com/2008/07/desejo-e-poderracismo-e-violncia.html#!/2008/07/desejo-e-poderracismo-e-violncia.html. (accessed Nov 16, 2011)

93 Racism in predominantly white gay, lesbian and bisexual communities: South Africa. http://people.ucalgary.ca/~ptrembla/gay-white-racism/europe-australia-canada.htm#south-africa. (accessed Nov 16, 2011).

94 Raymond HF, McFarland W. Racial mixing and HIV risk among men who have sex with men. *AIDS Behav* 2009; **13**: 630-637. CrossRef | PubMed

95 Peterson J, Jones K. HIV prevention for black men who have sex with men in the United States. *Am J Public Health* 2009; **99**: 976-980. CrossRef | PubMed

96 Public Health Agency Canada . People from countries where HIV is endemic—black people of African and Caribbean descent living in Canada. http://www.phac-aspc.gc.ca/aids-sida/publication/ps-pd/africacaribbe/pdf/ps-spreport-eng.pdf. (accessed March 21, 2011)

97 Westergaard R, Kirk G, Richesson D, Galai N, Mehta S. Incarceration predicts virologic failure for HIV-infected injection drug users receiving antiretroviral therapy. *Clin Infect Dis* 2011; **53**: 725-731. CrossRef | PubMed

98 Baillargeon J, Giordano T, Rich J, et al. Accessing antiretroviral therapy following release from prison. *JAMA* 2009; **301**: 848-857. CrossRef | PubMed

99 Fuqua V, Chen YH, Packer T, et al. Using social networks to reach black MSM for HIV testing and linkage to care. *AIDS Behav* 2012; **16**: 256-265. CrossRef | PubMed

100 Ibrahim F, Anderson J, Bukutu C, Elford J. Social and economic hardship among people living with HIV in London. *HIV Med* 2008; **9**: 616-624. CrossRef | PubMed

101 Robinson BE, Galbraith JS, Swinburne Romine RE, Zhang Q, Herbst JH. Differences between HIV-positive and HIV-negative African American men who have sex with men in two major US metropolitan areas. *Arch Sexual Behav* 201110.1007/s10508-011-9891-5. published online Dec 23. PubMed

102 Adebajo S, Myers T, Allman D, et al. Sexual health, HIV testing and health seeking behaviour of men who have sex with men (MSM) in Nigeria. International AIDS Conference; Mexico City, Mexico; Aug 3, 2008. MOPE0643.

103 Weiser SD, Frongillo EA, Ragland K, Hogg RS, Riley ED, Bangsberg DR. Food insecurity is associated with incomplete HIV RNA suppression among homeless and marginally housed HIV-infected individuals in San Francisco. *J Gen Intern Med* 2009; **24**: 14-20. CrossRef | PubMed

104 Weiser SD, Tsai AC, Gupta R, et al. Food insecurity is associated with morbidity and patterns of healthcare utilization among HIV-infected individuals in a resource-poor setting. *AIDS* 2012; **26**: 67-75. PubMed

105 Rubin M, Colen C, Link B. Examination of inequalities in HIV/AIDS mortality in the United States from a fundamental cause perspective. *Am J Public Health* 2010; **100**: 1053-1059. CrossRef | PubMed

106 Centers for Disease Control and Prevention . Funding allocations distributed under program announcement (PA) 04012 by state and local health departments in 2008 and 2009 for CDC-supported HIV prevention projects. http://www.cdc.gov/hiv/resources/reports/pdf/2008-2009_funding_allocations_report.pdf. (accessed Jan 11, 2012)

107 Foundation for AIDS Research and Johns Hopkins Bloomberg School of Public Health . Achieving an AIDS-free generation for gay men and other MSM: financing and implementation of HIV programs targeting MSM. http://www.amfar.org/uploadedFiles/_amfar.org/In_The_Community/Publications/MSM-GlobalRept2012.pdf. (accessed Jan 17, 2012)

108 Doerner R, McKeown E, Nelson S, Low N, Anderson J, Elford J. Ethnicity and sexual networks among MSM in Britain. *International AIDS Conference; Vienna Austria* 2010; **July 18—23**: TUPE0463. PubMed

109 Fox J, Castro H, Kaye S, et al. Epidemiology of non-B clade forms of HIV-1 in men who have sex with men in the UK. *AIDS* 2010; **24**: 2397-2401. PubMed

110 Bingham T, Harawa N, Johnson D, Secura G, MacKellar D, Valleroy L. The effect of partner characteristics on HIV infection among African American men who have sex with men in the young men's survey, Los Angeles, 1999—2000. *AIDS Ed Prev* 2003; **15** (1 suppl A): 39-52. PubMed

111 Tieu H-V, Murrill C, Xu G, Koblin B. Sexual partnering and HIV risk among black men who have sex with men: New York City. *J Urban Health* 2010; **87**: 113-121. PubMed

112 Moutinho L. Negociando com a adversidade: reflexões sobre "raça", (homos)sexualidade e desigualdade social no Rio de Janeiro. *Revista Estudos Feministas* 2006; **14**: 103-116. PubMed

113 Gunter M. Challenges and opportunities for behaviour change communication amongst young men (15–24 years) who have sex with men in Jamaica. International AIDS Conference; Vienna, Austria; July 18–23, 2011. WEPE0311.

114 Oster AM, Dorell CG, Mena LA, Thomas PE, Toledo CA, Heffelfinger JD. HIV risk among young African American men who have sex with men: a case-control study in Mississippi. *Am J Public Health* 2011; **101**: 137-143. CrossRef | PubMed

115 Bartholomew C, Saxinger WC, Clark JW, et al. Transmission of HTLV-I and HIV among homosexual men in Trinidad. *JAMA* 1987; **257**: 2604-2608. PubMed

116 Sanders EJ, Graham SM, Okuku HS, et al. HIV-1 infection in high risk men who have sex with men in Mombasa, Kenya. *AIDS* 2007; **21**: 2513-2520. CrossRef | PubMed

117 Tovanabutra S, Sanders E, Graham S, et al. Evaluation of HIV type 1 strains in men having sex with men and in female sex workers in Mombasa, Kenya. *AIDS Res Hum Retroviruses* 2010; **26**: 123-131. CrossRef | PubMed

118 Beyrer C, Baral SD, van Griensven F, et al. Global epidemiology of HIV infection in men who have sex with men. *Lancet* 2012. published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60821-6.

119 Millett GA, Ding H, Lauby J, et al. Circumcision status and HIV infection among black and Latino men who have sex with men in 3 US cities. *J Acquir Immune Defic Syndr* 2007; **46**: 643-650. CrossRef | PubMed

120 Uganda Ministry of Health . The crane survey report: high risk group surveys conducted in 2008/09. Kampala, Uganda: Uganda Ministry of Health, 2010.

121 Millett GA, Flores SA, Marks G, Reed JB, Herbst JH. Circumcision status and risk of HIV and sexually transmitted infections among men who have sex with men: a meta-analysis. *JAMA* 2008; **300**: 1674-1684. CrossRef | PubMed

122 Wiysonge CS, Kongnyuy EJ, Shey M, et al. Male circumcision for prevention of homosexual acquisition of HIV in men. *Cochrane Database Syst Rev* 2011; **6**: CD007496. PubMed

123 Wade AS, Kane CT, Diallo PA, et al. HIV infection and sexually transmitted infections among men who have sex with men in Senegal. *AIDS* 2005; **19**: 2133-2140. PubMed

124 Sanders EJ, Thiong AN, Okuku HS, et al. High prevalence of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* infections among HIV-1 negative men who have sex with men in coastal Kenya. *Sex Transm Dis* 2010; **86**: 440-441. PubMed

125 Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect* 1999; **75**: 3-17. CrossRef | PubMed

126 Marmor M, Sheppard HW, Donnell D, et al. Homozygous and heterozygous CCR5-Delta 32 genotypes are associated with resistance to HIV infection. *J Acquir Immune Defic Syndr* 2001; **27**: 472-481. CrossRef | PubMed

127 Petrovski S, Fellay J, Shianna KV, et al. Common human genetic variants and HIV-1 susceptibility: a genome-wide survey in a homogeneous African population. *AIDS* 2011; **25**: 513-518. CrossRef | PubMed

128 Gonzalez E, Kulkarni H, Bolivar H, et al. The influence of CCL3L1 gene-containing segmental duplications on HIV-1/AIDS susceptibility. *Science* 2005; **307**: 1434-1440. CrossRef | PubMed

129 He WJ, Neil S, Kulkarni H, et al. Duffy antigen receptor for chemokines mediates trans-infection of HIV-1 from red blood cells to target cells and affects HIV-AIDS susceptibility. *Cell Host Microbe* 2008; **4**: 52-62. CrossRef | PubMed

130 Kelley C, Kaur S, Ibegbu C, et al. Differences in alpha4ß7 expression on CD4+ T cells among black and white HIV-men who have sex with men. Conference on retroviruses and opportunistic infections; Seattle, WA, USA; March 3–8, 2012. 567.

131 Hightow-Weidman LB, Hurt CB, Phillips G, et al. Transmitted HIV-1 drug resistance among young men of color who have sex with men: a multicenter cohort analysis. *J Adolesc Health* 2011; **48**: 94-99. CrossRef | PubMed

132 Oster AM, Pieniazek D, Zhang X, et al. Demographic but not geographic insularity in HIV transmission among young black men who have sex with men, Mississippi, USA. *AIDS* 2011; **25**: 2157-2165. CrossRef | PubMed

133 Ndiaye O, Diop-Ndiaye H, Tchiakpe E, et al. MSMs group in Senegal: evolution of HIV-1 primary drug resistance. 6th IAS conference on HIV pathogenesis, treatment and prevention; Rome, Italy; July 17–20, 2011. CDB108.

134 Rosenberg NA, Huang L, Jewett EM, Szpiech ZA, Jankovic I, Boehnke M. Genome-wide association studies in diverse populations. *Nat Rev Genet* 2010; **11**: 356-366. CrossRef | PubMed

a National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA

b Department of Psychology, Georgia State University, Atlanta, GA, USA

c Department of Medicine, Emory University, Atlanta, GA, USA

d Center for AIDS Prevention Studies, University of California, San Francisco, CA, USA

e Department of Sociomedical Sciences, Columbia University, New York, NY, USA

Correspondence to: Mr Gregorio A Millett, Centers for Disease Control and Prevention, 395 E Street, Washington, DC 20201, USA

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HIV in men who have sex with men 6

A call to action for comprehensive HIV services for men who have sex with men

Chris Beyrer, Patrick S Sullivan, Jorge Sanchez, David Dowdy, Dennis Altman, Gift Trapence, Chris Collins, Elly Katabira, Michel Kazatchkine, Michel Sidibe, Kenneth H Mayer

Lancet 2012; 380: 424–38
Published Online July 20, 2012 http://dx.doi.org/10.1016/S0140-6736(12)61022-8
This is the sixth in a Series of six papers about HIV in men who have sex with men

Center for Public Health and Human Rights, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA (Prof C Beyrer MD, D Dowdy MD); **Rollins School of Public Health, Emory University, Atlanta, GA, USA** (P S Sullivan PhD); **Asociación Civil Impacta Salud y Educación (IMPACTA), Lima, Peru** (J Sanchez MD); **Faculty of Humanities and Social Sciences, La Trobe University, Melbourne, VIC, Australia** (D Altman); **Centre for Development ofPeople (CEDEP), Lilongwe, Malawi** (G Trapence); **amfAR, The Foundation for AIDS Research, Washington, DC, USA** (C Collins MPP); **Makerere University, Kampala, Uganda, and the International AIDS Society, Geneva, Switzerland** (E Katabira MD); **University René Descartes, Paris, France** (M Kazatchkine MD); **UNAIDS, Geneva, Switzerland** (M Sidibe PhD); **and Fenway Health, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA** (K H Mayer MD)

Correspondence to: Prof Chris Beyrer, Center for Public Health and Human Rights, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD 21205, USA **cbeyrer@jhsph.edu**

Where surveillance has been done, it has shown that men (MSM) who have sex with men bear a disproportionate burden of HIV. Yet they continue to be excluded, sometimes systematically, from HIV services because of stigma, discrimination, and criminalisation. This situation must change if global control of the HIV epidemic is to be achieved. On both public health and human rights grounds, expansion of HIV prevention, treatment, and care to MSM is an urgent imperative. Effective combination prevention and treatment approaches are feasible, and culturally competent care can be developed, even in rights-challenged environments. Condom and lubricant access for MSM globally is highly cost effective. Antiretroviral-based prevention, and antiretroviral access for MSM globally, would also be cost effective, but would probably require substantial reductions in drug costs in high-income countries to be feasible. To address HIV in MSM will take continued research, political will, structural reform, community engagement, and strategic planning and programming, but it can and must be done.

Introduction

Gay, bisexual, and other men who have sex with men (MSM) have been a core population affected by the HIV/AIDS epidemic since the syndrome we now know as AIDS was first identified in previously healthy homosexual men in the USA in 1981.[1] It was soon clear that HIV had been circulating in human populations decades before this discovery, and through various routes of exposure. But the fact that HIV was first identified in gay men indelibly marked the global response, stigmatised those living with the virus, limited effective public health responses in some cases, and drove coercive and punitive ones in others.[2] In the fourth decade of the HIV epidemic, that these men and their communities should continue to endure stigma, discrimination, and scarceness of access to HIV services[3] and that homophobia should continue to potentiate the epidemic is unconscionable. This situation must change.

The newfound optimism in the HIV specialty, that early antiretroviral therapy is an effective preventive intervention strategy,[4] and that new prevention methods such as the combination of tenofovir and emtricitabine (Truvada) chemoprophylaxis have efficacy for MSM,[5] opens up real possibilities for the eventual achievement of control of HIV subepidemics in MSM.[6] And HIV treatment advances, coupled with the provision of culturally competent care, provide pathways forward toward the realisation of the right to health.[7] None of these goals can be achieved, however, if MSM continue to be denied health-care services. In too many settings in 2012, MSM still do not have access to the most basic of HIV services and technologies such as affordable and accessible condoms, appropriate lubricants, and safe HIV testing and counselling.[6]

In 2012, the global AIDS community is at a crossroads. Research advances suggest pathways to reach what US

Key messages

- HIV epidemics in 2012 are severe and expanding in MSM globally, in both low-income and high-income country settings. Despite evidence of this disproportionate burden, HIV in men who have sex with men continues to be understudied, under-resourced, and inadequately addressed.
- The ongoing exclusion of MSM from health care, and from full social and political participation, must change. No population at risk for HIV infection can be excluded if we are to achieve control of AIDS worldwide.
- A modest global investment of US$134 million in the coming year could provide enough condoms and lubricant to set a course towards averting 25% of global HIV infections in MSM in the next 10 years.
- The high transmission efficiency for HIV in MSM suggests that prevention approaches that can reduce probabilities of per-act transmission will probably be needed to produce substantial reductions in new infections. These interventions include antiretroviral-based approaches. Reductions in cost of antiretroviral drugs for primary prevention and for treatment will be crucial to the cost-effectiveness and feasibility of antiretroviral-based approaches to HIV in MSM, especially in high-income countries.
- MSM are citizens of every country of the world—national governments must develop comprehensive programmes to provide care, support, and preventive services for these men.
- Mobilisation and engagement of MSM remains crucial in the AIDS response. In many countries, only MSM are willing to fight anti-gay stigma, demand adequate health services, and bear the risks implicated in providing services.
- Human rights are universal, and sexual orientation is not grounds for exclusion.

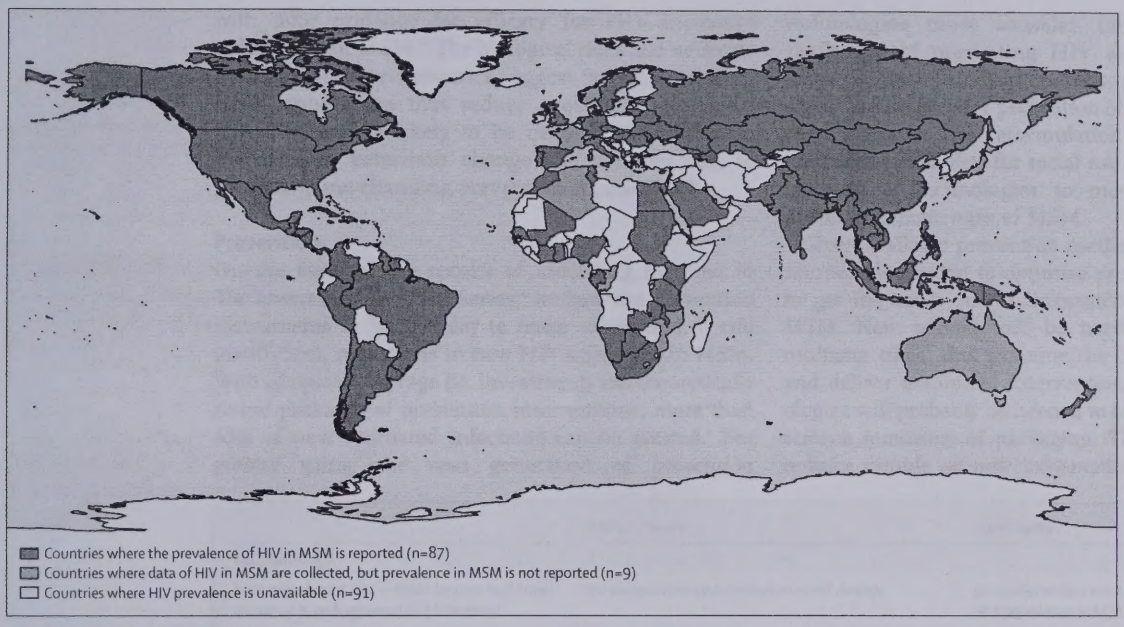
Countries where the prevalence of HIV in MSM is reported (n=87)
Countries where data of HIV in MSM are collected, but prevalence in MSM is not reported (n=9)
Countries where HIV prevalence is unavailable (n=91)

Figure 1: **Global surveillance of HIV in MSM, through 2011**
Data collected by year-end 2011; includes peer-reviewed publications, national and biobehavioural surveillance reports.[10] MSM=men who have sex with men.

Secretary of State Hillary Clinton has called "an AIDS-free generation".[8] Many argue that we now have the means in hand to achieve this goal—unimaginable only a few years ago.[9] And the unprecedented commitment of global resources to prevent HIV and treat AIDS, exemplified by the multibillion dollar commitments of the Global Fund to Fight AIDS, Malaria and Tuberculosis, the US PEPFAR Program, and various governments and private foundations, has saved millions of lives. But donor aid declined in 2011, as has general interest in HIV. We might not have the leadership and political support we need to achieve an "AIDS-free generation".[8]

For MSM, even more challenging realities exist than for the rest of the population. As reported by Beyrer and colleagues,[10] HIV infection rates in MSM have been increasing in many settings in the era of highly active antiretroviral therapy. A comprehensive review of the burden of HIV disease in MSM worldwide found that pooled HIV prevalence ranged from a low of 3·0% (95% CI 2·4–3·6) in the Middle East and north Africa to a high of 25·4% (21·4–29·5) of MSM in the Caribbean. Pooled HIV prevalence was fairly consistent across North, South, and Central America, south and southeast Asia, and sub-Saharan Africa, all within the 14–18% range.[10] Biological, network, and structural level risks for HIV specific to MSM populations are driving these epidemics globally, and new, or newly identified, outbreaks are being detected wherever surveillance is undertaken. Achieving an AIDS-free generation will not happen unless new and effective approaches are developed and implemented at scale for MSM. And that will not happen if these men are excluded from health care and denied full social recognition and political engagement. Yet their exclusion is common in some settings, and systematic in others. This situation too must change. No population at risk for HIV infection can be excluded if we are to achieve control of AIDS worldwide.

Calls to action

To address a health threat, this threat must be first acknowledged and investigated. By year-end 2011, only some 87 countries have reported prevalence of HIV in MSM (figure 1). Data are most sparse for the Middle East and Africa, regions where criminal sanctions against same-sex behaviour can make epidemiological assessments challenging.[10] Innovative approaches to sampling, and efforts to work with community-based groups from within gay and MSM communities can help reduce the risks associated with doing HIV assessments, even in settings where same-sex behaviour is highly stigmatised and criminalised.[9] Such assessments need to be done if we are to acknowledge, investigate, and address HIV in MSM. The table details a research agenda for MSM and HIV to address this concern. But doing research is not enough: epidemiological evidence must be used to help shape policy—an obvious statement, but one that remains widely unmet for MSM. Recent data also suggest that discrimination has reduced men's willingness to access services.[11] Where services are offered, the science suggests that these are often focused on interventions, such as individual-level behaviour change counselling,

with poor evidence for efficacy for HIV incidence reductions for MSM.[12] The biological risks and network-level transmission dynamics suggest that antiretroviral-based approaches that reduce probability of per-act transmission are likely to be needed, in addition to increases in behaviour change and condom use, to produce game-changing prevention approaches.[10]

Prevention

On the basis of the results of modelling reported in *The Lancet* HIV in MSM Series,[6] we have the prevention instruments in hand today to make substantial, if still insufficient, reductions in new HIV infections in MSM. With adequate coverage (ie, investment) and theoretically sound packages of prevention interventions, more than 40% of new estimated infections can be averted.[6] For greater gains, the next generation of prevention technologies must consider the unique biological challenges of preventing HIV acquisition for MSM: research must focus on tailoring products to optimise safety and efficacy for prevention of transmissions in the rectal mucosa. The reformulation of tenofovir gel for increased tolerability for rectal use is an example of the tailoring of technologies to meet the unique HIV prevention challenges of MSM.

Given available prevention methods, continuous commitment is needed to optimise prevention services and to get the most out of investments in prevention for MSM. New science will be needed, including large, multisite trials, that examine the best ways to package and deliver combined interventions, and new methodologies will probably be needed to answer the prevention science questions of packaging. The field will have to remain nimble as new information becomes available

	Example study	Comments
Epidemiology		
How prevalent is HIV in MSM by country? How common is undiagnosed HIV infection?	HIV seroprevalence or biobehavioural surveys	91 countries lack even basic information about HIV prevalence in MSM
What is HIV incidence in MSM?	Cross-sectional or prospective studies of MSM in diverse settings	Laboratory methods allow preliminary estimates of HIV incidence with cross-sectional samples; cohort studies with repeat testing offer direct measures of incidence, and allow determination of factors associated with incidence
How many MSM are in need of prevention services by country?	Development and validation of methods to estimate the size of MSM populations	..
Economics		
How much do MSM-targeted prevention approaches cost, and what can they save in terms of averted treatment?	Cost-effectiveness analyses of HIV prevention activities in MSM	..
What funding mechanisms exist for prevention of HIV in MSM, and how can they best be mobilised?	Financing analysis of resources for HIV prevention in MSM, with links to advocacy	..
Basic sciences		
What vaccines hold promise for prevention of HIV infections through rectal mucosa?	Phase 1 and 2 HIV vaccine trials	..
What formulations of rectal microbicides are most acceptable, safe, and efficacious? What are the penile effects of rectal microbicides for insertive partners?	Phase 1 and 2 microbicide trials	..
How do we develop capacity for future efficacy trials of rectal PrEP?	Establish and maintain MSM cohorts in diverse areas with high HIV incidence	..
Promoting optimal care		
How do we best promote routine HIV testing for MSM and increase awareness of HIV serostatus?	Studies of electronic (SMS) reminders, couples HIV counselling and testing, at-home self HIV testing	..
How can we best engage MSM into care?	Develop training and assess how best to train health facility-based counsellors, health workers and peer educators to offer HIV testing and ART care for MSM	..
How do we improve service delivery for MSM? What is the role of resource allocation modelling to improve HIV prevention for MSM?	Operational research on HIV testing and counselling, antiretroviral uptake and adherence, prevention for HIV positives, STI treatment for HIV-positive people; cost-effectiveness studies	..
What is the role for screening or presumptive treatment for *Neisseria gonorrhoea* or *Chlamydia trachomatis*? At what interval should screening occur?	Revise national treatment guidelines for STI to include treatment for proctitis Evaluate WHO guidelines for presumptive treatment and assess frequency of presumptive proctitis treatment for at-risk MSM in Africa	..

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	Example study	Comments
(Continued from previous page)		
Combination approaches		
What combinations of HIV prevention interventions have greatest effect on HIV incidence?	Testing feasibility and acceptability of prevention packages, testing package efficacy	..
What are the best ways to test combination packages of interventions?	Development of new methods to test packaged interventions, including non-RCT methods and community-randomised approaches	..
Testing promising approaches		
Are reformulated female condoms acceptable and safe for use in anal sex?	Safety and acceptability studies of female condoms in MSM	..
How can new technologies (eg, SMS reminders, smartphones, online behavioural surveillance, internet interventions) support HIV prevention for MSM?	Development and testing of interventions, using the most prevalent technologies within countries or regions	..
Do promising vaccine approaches offer comparable efficacy in MSM?	Phase 3 vaccine trials	WRAIR trial planned for Thai MSM
Can HIV acquisition be reduced through early treatment of HIV-positive MSM and oral daily PrEP?	RCTs with MSM who start ART early (*vs* deferred treatment), and oral daily PrEP (*vs* placebo), assess effect of an intensified adherence intervention *vs* standard of care, and monitor emergence of transmitted drug resistance for tenofovir and emtricitabine (Truvada)	..
Can treatment of primary substance use problems reduce HIV risk?	Assessment of pharmacological, behavioural, or combination protocols for efficacy in reducing HIV endpoints	..
Structural approaches		
How do stigma and homophobia or homoprejudice promote HIV risks? And how can we intervene to reduce these effects?	Integrative studies of how prevalent community factors shape HIV risks through networks and individual behaviours; intervention conceptualisation, development and testing to reduce stigma and homophobia or homoprejudice	..
What educational or behaviour change approaches lead to greater provider assessment of male-male sex risk, and provision of appropriate clinical services?	Development and assessment of interventions to promote ascertainment of male-male sex for current providers; development and assessment of curricula for training of medical providers; development, assessment, and implementation of systematic approaches to promote screening and prevention services specific to MSM within diverse health-care settings	..

MSM=men who have sex with men. PrEP=pre-exposure prophylaxis. SMS=short message service. ART=antiretroviral therapy. STI=sexually transmitted infections. RCT=randomised controlled trial.

Table: **A research agenda for MSM and HIV with questions to be addressed**

about new products such as rectal microbicides and, more distantly, HIV vaccines.

In communities around the world, work is needed to set right the legal, social, and structural impediments to the safe, effective delivery of basic prevention services for MSM, including condom and safe lubricant promotion and distribution. The best biomedical and behaviour change interventions cannot succeed without spaces in which men can safely seek care and services, communicate openly about their sexual lives, and be supported to adopt available preventive options. Governments and the management of health-care delivery systems must set expectations for the provision of culturally competent care, and must support their providers to meet that expectation by providing time and resources for training. Modest investments in these priorities will increase the effectiveness of available prevention interventions by increasing uptake of prevention services and early access to testing and treatment (panel 1).

Clinical resources

All engaged in HIV work must pay more attention to the health disparities that MSM encounter. Additionally to biological risks, reasons for the increased risk for HIV and sexually transmitted infections (STIs) in MSM include individual factors (eg, depression and substance use) that might be a reaction to homophobic experiences and the stresses of societal pressures to conform to heterosexual norms, as well as structural factors, including systematic underfunding of HIV prevention for MSM, and scarcity of access to primary health services and culturally sensitive counselling.[7] Given that MSM are citizens of every country of the world, national governments must develop comprehensive programmes

to provide care, support, and preventive services for MSM. Funders, who focus on addressing the challenges of the global AIDS epidemic, must ensure that resources are proportionately allocated to support the care and preventive service needs of MSM.

Youth

Many of the root causes of health disparities stem from adverse experiences that MSM youth accrue as they become aware of their sexual orientation. Adolescence can be a period of identity integration, and successful development is most likely when youth feel that they can discuss their emotions and concerns in supportive and informed environments. Because discrimination and scarce social support are associated with HIV infection in MSM,[13,14] increased attention to the importance of supportive families and educational systems for the healthy development of MSM and other sexual and gender minority youth is fundamental to the success of primary prevention. Providers need to learn about local outreach agencies, hotlines, and media that can connect adolescents with positive role models and social opportunities. Health-care providers are trusted sources of information, and might be able to encourage adolescent acceptance by family members. Providers can also have important roles in condom and lubricant access and education for adolescents, who face challenges different from those of adult men in acquisition and use of these basic prevention methods. The programmes directed at homophobia in schools in

Panel 1: What is comprehensive care for MSM?

Sexual health not only includes the absence of disease, but the possibility of having safe and pleasurable sexual experiences. Where homosexuality remains illegal and stigmatised, there are strong disincentives for men who have sex with men (MSM) to disclose their sexuality to health practitioners, resulting in missed opportunities for preventive screening, sustaining the high prevalence of HIV and asymptomatic sexually transmitted diseases (STDs) in some MSM. Comprehensive sexual health care includes: engagement with knowledgeable and supportive health-care providers; routine periodic screening for HIV and other STDs (particularly syphilis and anogenital *Chlamydia* and gonorrhoea); screening for hepatitis A, B, and C, and vaccinating all who are susceptible. Human papillomavirus vaccination, especially for younger MSM (aged younger than 26 years), should be part of a standard prevention package. No uniform consensus on the frequency of anal cytological screening exists, especially for HIV-uninfected MSM, but reports of increased risk for anal neoplasia suggest that additional support to elucidate the optimum management strategies is urgently needed, particularly for MSM in resource-constrained environments. Comprehensive clinical care also requires informed providers to educate their patients about ways in which they can avoid HIV/STI transmission and acquisition, including the provision of condoms, water-based lubricants, and discussion of chemoprophylaxis. Providers should also routinely screen male patients who have sex with men for common coexistent mental health conditions, particularly depression and substance use, and should be informed so that they can make appropriate referrals to local services that can address these concerns. Providers need to become knowledgeable about MSM health disparities, and the optimum ways to provide culturally competent care in order to optimise their MSM patients' wellbeing.

Panel 2: Why We Have No Choice by Archbishop Emeritus Desmond Tutu

In my beloved country, South Africa, we know all too much about the human cost of prejudice, of discrimination. We learned through painful decades what exclusion can mean, and what terrible and lasting effects it can have for the health and wellbeing of individuals, families, and communities. The apartheid system legalised discrimination based on racial categories. It said, in essence, you blacks are inferior. You deserve less because of who you are and what colour you were born. This was a crime against the majority of the people of my country. But it was also a crime against God. For I know in my heart, I know as all faith traditions teach, that there are no inferior people in his eyes. No one deserves less of God's love, less of his mercy, or less of his justice. The papers in *The Lancet* Series on HIV in men who have sex with men (MSM) tell us about how far we have to go in providing care, in acceptance, in ceasing to withhold our love. They also tell us what we each already know, if we are prepared to be honest with ourselves—that lesbian, gay, bisexual, and transgender (LGBT) people are a part of every human community. LGBT people already have God's full love and acceptance—they are his children too. But they need our acceptance, our love. And to the extent that legal discrimination, those old laws and statutes that make them inferior still exist, it is up to all to work to change those laws. I have no doubt that in the future, the laws that criminalise so many forms of human love and commitment will look the way the apartheid laws do to us now—so obviously wrong. Such a terrible waste of human potential.

Yet I am so heartened in my 80th year by the young people I meet all over the world, who seem to already know this, and have moved so far from intolerance. They are our hope for a more accepting and loving world. And for the LGBT youth out there who are struggling, who are made to feel inferior, let me say this: God loves you as you are. He wants you to live and to thrive. So please take care of yourself, educate yourself about HIV, protect your partners, honour and cherish them. And never let anyone make you feel inferior for being who you are. When you live the life you were meant to live, in freedom and dignity, you put a smile on God's face.

countries such as Brazil[2] are an essential part of the development of a world in which sexuality can be openly and honestly discussed, and this is equally important for women and people who struggle with rigid gender norms. Sexual minority youth need more than tolerance—they need full acceptance, as exemplified by spiritual leaders like Archbishop Emeritus Desmond Tutu (panel 2).

Health disparities

Health disparities between MSM and heterosexual populations might stem from biological and epidemiological factors; social inequities might also help fuel these disparities. Millett and colleagues[15] found greater HIV disparities in MSM relative to general populations in African and Caribbean countries where homosexual

Panel 3: Calls to action for a comprehensive response for MSM

Governments

- Reduce legal, regulatory, and structural barriers to access to health care for men who have sex with men
- Reform laws and policies that discriminate against citizens on the basis of sexual orientation and gender identity including repeal of laws that criminalise consensual sex between adults of the same sex
- Remove legal, regulatory, and administrative barriers to the formation of MSM or LGBT community organisations
- Ensure access to HIV prevention, treatment and care services, including access to condoms and safe lubricants for all men in prison and other forms of detention
- Provide training for police and other law enforcement staff to end harassment, arbitrary detention, ill-treatment, and abuse of MSM and other sexual minorities
- Publicly support programmes and policies that reduce stigma/discrimination against marginalised groups, and protect the human rights of all sexual minorities
- Dedicate adequate domestic funding to address health needs of MSM
- Include MSM in epidemiological surveillance and make results publicly available
- Include civil society, including MSM, in national health planning

Ministries of health

- Fulfil the right to health by ensuring non-discrimination in health-care services, reducing stigma and homophobia in health-care settings, and providing education to all providers in culturally competent care
- Markedly increase coverage of HIV services for MSM commensurate with need and disease burden
- Establish programmes for MSM health-care leadership development
- Hire and promote sexual and gender minorities in the health-care workforce
- Involve community leaders and representatives in health-care planning, management, and delivery for MSM, including through Global Fund Country Coordinating Mechanisms

Donors

- Address the current under-funding of the responses to HIV among MSM: current levels of coverage (10–20% of MSM worldwide having access to any targeted HIV prevention) must be increased five-to-ten fold to address the gaps
- Increase support for the research agenda for combination HIV prevention and care services for MSM
- Base funding priorities on the best available programmatic evidence to reduce disease burden—and make funding contingent on scientifically sound assessments of need for key populations, including MSM; because we know that MSM are present in every society, do not wait for detailed epidemiological studies to commit resources to addressing HIV among MSM
- Collect data and report on MSM-related HIV funding and programming you support, and make this information publicly available on websites, and through annual reports, and other mechanisms
- Provide assistance to ensure collection of epidemiological data on MSM and other most-at-risk groups
- Establish dedicated funding mechanisms to ensure adequate resources are provided to meet the needs of most at-risk groups, including MSM
- Provide direct funding to civil society organisations to deliver services and advocate for evidence-based, non-discriminatory policies
- Discontinue funding for non-governmental organisations that actively work against human rights and equality for sexual minorities
- Support capacity development for MSM civil society, and insist on their inclusion in decision making
- Establish a coordinated global donor strategy to improve public health outcomes for MSM in the HIV epidemic

Providers

- Act to reduce stigma and discrimination against sexual minority clients in health-care facilities
- Refrain from participation in health programmes that are not evidence based or that violate human rights, including so-called reparative therapy or conversion therapy
- Ensure training in culturally competent care for all personnel in clinical settings, including non-clinical staff (security, intake) who might interact with MSM
- Provide integrated services for mental health concerns and substance use for MSM in need. Substance-using MSM should be routinely screened for HIV and STIs
- For providers who care for adolescents and young adults, learn about local outreach agencies, hotlines, and media that can connect sexually questioning or LGBT adolescents with positive role models and social opportunities

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Researchers

- Ensure, whenever feasible and scientifically appropriate, the inclusion of MSM, including same-sex couples, in HIV research
- Advocate for and engage in research on the biology of anorectal transmission of HIV, and the identification of prevention targets for this mode of acquisition and transmission
- Engage with LGBT and MSM community partners in the design, conduct, and dissemination of research relevant to the community
- Assess the costs and cost-effectiveness of HIV prevention and treatment in MSM, including the patient and community perspective
- Expand operations research to develop, identify, and refine scalable HIV services for MSM
- Expand research on MSM-relevant issues in understudied regions, including Asia, Africa, the Middle East and north Africa, eastern Europe, and central Asia

Community members

- Demand that the human rights and dignity of MSM and other sexual minorities be promoted, protected, and fulfilled in all aspects of HIV policy and programmes
- Organise and participate in all aspects of LGBT rights and health
- Advocate for the development and scale-up of combination HIV prevention for MSM
- Coordinate across community groups in low-income, middle-income, and high-income countries to press for global responses to HIV in MSM. Support LGBT and MSM community groups in rights-constrained environments
- Monitor the work of governments, donors, and multilaterals and hold them accountable for adequate programming and policy to address HIV in MSM
- Create an accountability system that tracks policy, law, programming, and financing on the response to HIV in MSM

MSM=men who have sex with men. LGBT=lesbian, gay, bisexual, and transgender. STI=sexually transmitted infection.

sex was criminalised than in countries without state sanctioned criminalisation policies. Poverty, immigration status, access to health services, and other social factors affect HIV disparities in subgroups of MSM by limiting access to HIV prevention technologies or HIV treatment. And in many settings, particular subgroups of MSM remain at disproportionate risk for HIV (eg, black MSM in the USA and first nation MSM in Canada).[16] Addressing individual-level risk behaviours while ignoring contextual factors that contribute to infection risk will not meaningfully reduce these racial or ethnic disparities.

Mental health

At least partly in response to growing up in unsupportive environments, MSM have higher rates of depression and other mood disorders than do their heterosexual peers.[17,18] Although the cause of mental health disorders is complex and other individual, genetic, and social factors might have a role, a common ameliorable factor is societal homophobia. Structural interventions to decrease homophobia can be expected to improve mental health outcomes for MSM,[19] and provision of culturally competent mental health services for MSM can result in improved outcomes for MSM clients.[20]

Efficacious and scalable pharmacological and behavioural interventions—as well as structural and community-level approaches—are urgently needed to reduce substance use and associated comorbidities in MSM. MSM who use substances have unique and complex health needs that are often unmet, so the need for cultural competence extends to health and substance use treatment providers. Provision of integrated services for mental health concerns and substance use could provide synergistic and additive benefits.

For more on **the Gay and Lesbian Medical Association** see http://www.glma.org

For more on **GMHC** see http://www.gmhc.org

For more on the **Fenway institute** see http://www.thefenwayinstitute.org

For more on **health4men** see http://www.health4men.co.za

The charge to providers

MSM have historically received inadequate, if not discriminatory, care throughout the world. In most countries, specific education of future physicians, nurses, and other health care providers is missing, resulting in a dearth of optimum health-care settings for MSM. Culturally competent care for MSM must focus on (1) medical disorders for which MSM are at increased risk because of specific exposures (eg, unprotected anal intercourse); (2) behavioural concerns which might be triggered by external or internalised homophobia; and (3) unique areas that require specific culturally competent understanding (eg, same-sex spousal counselling). Many methods to promote such culturally competent care are available in the form of published and online resources (such as the Gay and Lesbian Medical Association, GMHC, the Fenway Institute, and the health4men websites). There are also guidance documents on improvement of care for MSM put forward by the US PEPFAR Program,[21] and HIV and STI care for MSM from WHO.[22]

Resilience

Research is needed to understand how many MSM lead resilient and productive lives in the face of discrimination and avoid HIV infection in context of high HIV prevalence in their networks and communities. Analyses of risk have described associations of inconsistent condom use with HIV acquisition, whereas less attention has been given to the substantial proportion of MSM reporting consistent condom use and lower HIV rates. Stall and colleagues[23] noted in a review of resilience in MSM that in a recent study of MSM with three or more psychological health problems, some 77% of men had not engaged in high-risk sexual behaviours, and 78% had remained HIV negative.

George and colleagues[24] in a study of black gay men in Toronto noted the importance of community and sense of belonging to resilience in these men, and suggested that HIV preventive interventions should include community-based approaches.

The role of community

Engagement of affected communities defines much of what is unique in the response to AIDS. From the epidemic's beginning, gay men, lesbians, and their non-gay allies have been at the forefront of AIDS advocacy and service delivery, fighting for resources, legal changes, and research. Mobilisation and engagement of MSM remains crucial in the AIDS response.[25] In many countries, only MSM are willing to fight anti-gay stigma, demand adequate health services, and bear the risks implicated in providing services.

Increasingly, effective advocacy will include the use of epidemiological surveys, modelling to optimise resource allocation, acting on the nexus between human rights and health, and operations research to tailor successful and scaled programmes. To nurture a new generation of gay advocacy around the world, donors and governments must support these groups, enable development of technical capacity, and ensure engagement in policy making.

Gay-community engagement has a history of advancing responses to AIDS and laying the groundwork for other communities at heightened risk. Advocates can greatly increase attention to the MSM epidemic in numerous countries where it remains ignored, and push for responses to AIDS that are better funded and more equitable and effective.

Political challenges in the AIDS response

That AIDS was first diagnosed in homosexual men in the USA has continued to mark the ways in which the epidemic is perceived. Stakeholders have struggled with the ways in which this perception has distorted priorities and understanding. Homosexuality and AIDS have been interconnected within global politics, and in many countries the mobilisation around HIV has built on earlier gay movements.[26,27] Paradoxically, AIDS has both increased stigma against homosexuality and created spaces—and some resources—to develop movements to combat this.

Over the past decade there has been an important shift within international human rights debates, and growing recognition that sexual diversity is central to human rights.[28] This principle has been subject to debate, and these controversies are part of much larger disputes around universalism and specific cultural and religious teachings. Specific traditions often focus on sexual behaviour, and become a terrain for accusations of western neocolonialism.[29] At national levels, the inclusion of groups representing homosexual men and other marginalised populations, has often been a matter for substantial struggle. International institutions such as UNAIDS and the Global Fund have consistently pushed for their inclusion. Equally, the mobilisation of lesbian, gay, bisexual, and transgender (LGBT) people, around AIDS has had a larger effect on social norms and, in some cases, ameliorated the ways in which health workers, police, and government officials interact with these communities. It is our firm belief that arguments about culture, tradition, or religion cannot be used to override the basic right of all human beings to enjoy bodily security and the right to sexual health, and that these rights are

Panel 4: Global Commission on HIV and the Law—law reform for public health impact

A growing chorus of voices is calling for the repeal of punitive laws against men who have sex with men (MSM), arguing that such laws violate human rights and undermine public health programming. Over the course of 2011, the Global Commission on HIV and the Law examined this issue among others, to ascertain the evidence of this association and to shape appropriate recommendations. The 14 member Commission, chaired by Fernando Henrique Cardoso (former President of Brazil), assessed research and submissions from more than 1000 authors covering 140 countries, as well as engaging parliamentarians, ministries of justice and health, judiciaries, lawyers, police, civil society, and community groups in frank and constructive policy dialogue.

The Commission concluded unequivocally that laws criminalising consensual adult same-sex relations, as well as a range of other laws and legal practices, are undermining effective HIV programming with and for MSM. The Commission found that:

- Laws or legal provisions criminalising HIV transmission and exposure are arbitrarily and disproportionately applied to those who are already deemed inherently criminal, such as MSM. This situation not only portrays and perpetuates existing inequalities, but also increases stigma against these men and impedes their access to existing HIV and health services.
- In far too many countries, discriminatory and brutal policing is tacitly authorised by punitive laws and social attitudes. Such law enforcement practices violate the human rights of MSM and drive them away from HIV and health services.
- Countries that have only recently decriminalised consensual, adult same-sex activity but do not have adequate protections of human rights for MSM have greater prevalence of HIV risk than do those with adequate protections, thus harming MSM and the wider community.
- The criminalisation of consensual, adult, same-sex activity both causes and boosts HIV risk. Where consensual, adult same-sex activity is not criminalised, HIV prevalence in this population is often lower.

The Commission concluded that decriminalisation of consensual, adult same-sex activity alone will not transform HIV responses—it must be accompanied by effective measures to prevent violence against MSM, enforcement of antidiscrimination laws that prohibit discrimination based on sexual orientation and gender identity, and removal of legal barriers to accessing HIV and health services and forming community organisations.

Progress is being made: international and national leaders are beginning to speak up for equality regardless of sexual orientation, some countries are prohibiting discrimination on the basis of sexual orientation, courts in various countries are looking to human rights standards to strike down archaic laws criminalising adult same-sex activity, and in some places where effective legal aid has made justice and equality a reality for MSM, health outcomes have improved. Even in societies in which homosexuality has traditionally not been accepted, more tolerant views are emerging.

Reforming legal environments for MSM is not without its political challenges, but it is the right thing to do. Not only because it is essential to slowing the spread of HIV and ensuring the full realisation of human rights, but because governments have far more urgent priorities than interfering in the private lives of consenting adults.

Panel 5: Selected Yogyakarta principles

1 The right to the universal enjoyment of human rights
All human beings are born free and equal in dignity and rights. Human beings of all sexual orientations and gender identities are entitled to the full enjoyment of all human rights.

17 The right to the highest attainable standard of health
Everyone has the right to the highest attainable standard of physical and mental health, without discrimination on the basis of sexual orientation or gender identity. Sexual and reproductive health is a fundamental aspect of this right.

18 Protection from medical abuses
No person may be forced to undergo any form of medical or psychological treatment, procedure, testing, or be confined to a medical facility, based on sexual orientation or gender identity. Notwithstanding any classifications to the contrary, a person's sexual orientation and gender identity are not, in and of themselves, medical conditions and are not to be treated, cured, or suppressed.

24 The right to found a family
Everyone has the right to found a family, regardless of sexual orientation or gender identity. Families exist in diverse forms. No family may be subjected to discrimination on the basis of the sexual orientation or gender identity of any of its members.

Panel 6: From a transcript of Secretary of State Hillary Clinton's Human Rights Day speech, delivered Dec 10, 2011, in Geneva

Some have suggested that gay rights and human rights are separate and distinct; but, in fact, they are one and the same. Now, of course, 60 years ago, the governments that drafted and passed the Universal Declaration of Human Rights were not thinking about how it applied to the LGBT community. They also weren't thinking about how it applied to indigenous people or children or people with disabilities or other marginalised groups. Yet in the past 60 years, we have come to recognise that members of these groups are entitled to the full measure of dignity and rights, because, like all people, they share a common humanity.

This recognition did not occur all at once. It evolved over time. And as it did, we understood that we were honouring rights that people always had, rather than creating new or special rights for them. Like being a woman, like being a racial, religious, tribal, or ethnic minority, being LGBT does not make you less human. And that is why gay rights are human rights, and human rights are gay rights.

It is violation of human rights when people are beaten or killed because of their sexual orientation, or because they do not conform to cultural norms about how men and women should look or behave. It is a violation of human rights when governments declare it illegal to be gay, or allow those who harm gay people to go unpunished. It is a violation of human rights when lesbian or transgendered women are subjected to so-called corrective rape, or forcibly subjected to hormone treatments, or when people are murdered after public calls for violence toward gay people, or when they are forced to flee their nations and seek asylum in other lands to save their lives. And it is a violation of human rights when life-saving care is withheld from people because they are gay, or equal access to justice is denied to people because they are gay, or public spaces are out of bounds to people because they are gay. No matter what we look like, where we come from, or who we are, we are all equally entitled to our human rights and dignity.

LGBT=lesbian, gay, bisexual, and transgender.

implicit in all major religious and ethical systems. Panel 3 details calls to action for a comprehensive HIV prevention and care response for MSM and the many stakeholders whose efforts will be required to achieve these goals.

The primacy of human rights

Human rights abuses are important social determinants of vulnerability to HIV, whereas rights protections can enhance uptake, use, and impact of HIV interventions.[30] Human rights principles, language, and frameworks have helped in the advocacy to end discriminatory practices in health care, the push for antiviral drug access, and the mitigation of daily struggles for human dignity and social justice.[31] For sexual-minority populations, human rights abrogation or protection have had particularly profound effects. LGBT individuals continue to be criminalised for their sexual orientation in more than 80 countries; in many others, they face discrimination in education, housing, employment, family life, and health care.[32] Men in several countries still face the death penalty for same sex relations between consenting adults (panel 4).[33]

The use of human rights laws and rights-based approaches has been limited by criminalisation—by the argument that sexual minorities are excluded from universal human rights by virtue of engaging in criminal behaviour. The clearest articulation of the universality of human rights for all people, including sexual and gender minorities, is arguably the Yogyakarta Principles of 2006.[34] The 29 Yogyakarta Principles were the result of an expert group drawn from all continents, which reviewed existing international human rights laws and their application to sexual and gender minorities.

Four of the principles have particular relevance for MSM and HIV (panel 5). Principle 1 articulates entitlement to full human rights, freedom, equality, and dignity, and has been invoked in recent court decisions decriminalising homosexuality in Nepal and India. Principle 17 reaffirms existing human rights conventions on the right to health care access; principle 18 (the right to the highest attainable standard of health) is of crucial importance to MSM globally, because approaches to changing sexual orientation are common and are not evidence based.[35] This principle is particularly important for LGBT adolescents, who are susceptible to family and

institutional attempts to alter sexual orientation or gender identity. Principle 24 (the right to found a family), also has relevance to HIV prevention for MSM. In many settings, it is virtually impossible for male same-sex couples to found families, to live together, find housing, or enjoy privacy rights. These realities undermine stable relationships, and can increase the likelihood of anonymous and unsafe sexual encounters.[36]

Human rights are universal, and sexual orientation is not grounds for exclusion. Various southern countries, including Brazil and South Africa, are working within the UN to introduce resolutions that make clear that this view is held by diverse countries (panel 6).

Structural changes for improved HIV responses for MSM

Structural factors, including legal, policy, and socio-cultural conditions, can substantially affect access to HIV services for MSM. A recent report investigated HIV financing and implementation of HIV programmes for MSM, and found a powerful correlation between criminalisation of same-sex behaviour and lack of investment in services.[9] Where laws against same-sex behaviour were absent, stigma and discrimination at a social and cultural level are still substantial barriers to HIV services for gay and other MSM.

Decriminalisation of same-sex behaviour has been seen as a key structural intervention to legitimise HIV services for gay and other MSM.[12] India's British-era sodomy laws were repealed, partly on the basis of the impediment they presented to HIV prevention for MSM. In both India and Nepal, government programmes were providing condoms, but MSM and transgender outreach workers were being harassed by police for providing those condoms. The repeal of sodomy and other anti-homosexuality statutes can end such abuses and create enabling environments for HIV risk reduction, but can only succeed within a larger framework that recognises the right to sexual diversity. It is necessary to confront those arguments based on narrow appeals to culture, religion, and tradition which defend violence, persecution, and denial.

Rethinking MSM as whole men, as couples, and as families

To further HIV prevention and the promotion of health more generally, MSM must be considered in broader contexts. Male couples can be thought of as dyadic units of risk, but increasingly are also being considered as dyadic units of opportunity for prevention.[37] Couples HIV counselling and testing (CVCT), long a component of HIV prevention programmes in Africa, has been adapted and assessed in the USA.[38] Beyond the prevention value of counselling, testing, and mutual disclosure, testing couples together recognises the validity of partnerships; interventions to promote stability of partnerships between men have been suggested to be an important strategy for HIV prevention.[36] The engagement of men in same-sex couples as couples, and not only as individuals, for HIV prevention, comes at a time when early steps are being made that enable men to be safe, visible, and open in partnerships and that establish supportive societal institutions to promote stability of couples (eg, marriage equality). In these ways, policy and legal constructs have the ability to support or constrict opportunities for HIV prevention with male couples.

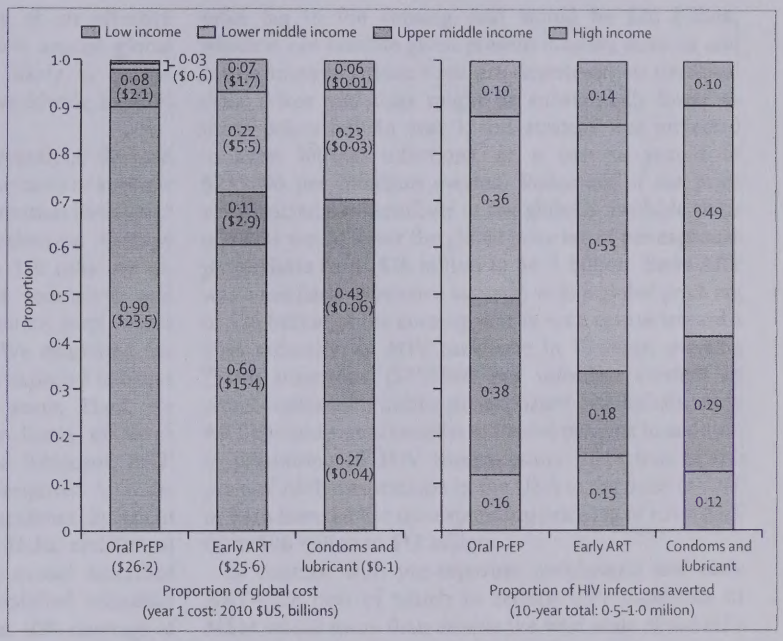

Figure 2: **Proportional costs and HIV infections in MSM averted, by income category**
Bars show the proportion of total estimated global costs (see text and supporting information) and cumulative global HIV infections in MSM averted over 10 years,[6] according to World Bank income category. Note that high-income countries shoulder most costs (especially for drugs) while averting few HIV infections. This suggests that a more equitable balance could be achieved by prioritising the response in lower-income settings (where unmet burden is highest and resources most constrained) while simultaneously lowering drug prices in high-income areas. MSM=men who have sex with men. PrEP=pre-exposure prophylaxis. ART=antiretroviral therapy.

Similarly, HIV programmes in parts of the world with generalised heterosexual epidemics, such as sub-Saharan Africa, have been more comprehensive in considering HIV and its prevention in terms of families. We must recognise that very diverse patterns of familial and sexual arrangements exist, and that many MSM might also be in heterosexual relationships, have children, and are part of large familial and communal structures. A far broader and more honest dialogue, beginning in schools and sex education courses, is needed if we are to ensure better sexual health for all people, not just those who may identify as part of particular communities.

Costing out the response

If we are to respond effectively to the global HIV epidemic in MSM, we must understand how much an effective response is likely to cost. We did a costing

exercise to estimate the affordability of an effective response, measured as the approximate annual global price tag for a set of interventions likely to reduce cumulative HIV incidence in MSM worldwide by 25% over 10 years.

We considered three different interventions deemed most likely to achieve such effect, on the basis of a review by Sullivan and colleagues[6] of the prevention literature:[6] oral pre-exposure prophylaxis, antiretroviral therapy (ART) at a CD4 count of fewer than 350 cells per μL (at 500 cells per μL in high-income countries), and increased protection of anal intercourse with wider uptake of condoms and lubricants.[6] We estimated the cumulative number of HIV infections expected to occur in MSM globally over the next 10 years. Then, we estimated the uptake and coverage levels of three separate interventions—condoms and lubricant, ART, and oral pre-exposure prophylaxis—required to independently reduce cumulative HIV incidence by about 25% across four countries (USA, Peru, India, and Kenya) using the individual-based stochastic model described by Sullivan and colleagues.[6] The modelled scenarios were: for oral pre-exposure prophylaxis, 40% coverage of all eligible high-risk MSM, with 75% adherence (25% reduction in incidence over 10 years); for ART, 80% coverage of HIV-positive individuals with a CD4 count of 350 cells per mm^3 or less (19% reduction); and for distribution of condoms and lubricant, protecting 30% of all acts of unprotected anal intercourse (30% reduction). To provide a projection of more immediate effect, we also estimated the reduction in incidence achievable in one year under each of these three strategies (figure 2).

By considering these four countries as representative of the four corresponding World Bank income categories, we estimated the global investment in the coming year needed to achieve the necessary uptake and coverage level for each intervention separately. Costs of promoting and distributing condoms and lubricant were taken at the high range (US$0·40 per condom) from a comprehensive cost analysis reported by the World Bank in 2011.[35] ART costs (ranging from $13 350 per person-year in high-income countries to $1129 in low-income countries) were taken from a recent review.[39] The cost of oral pre-exposure prophylaxis in high-income countries ($8592 per person-year) was estimated from a recent modelling analysis;[40] at other income levels, we summed individual costs of drugs and monitoring. We then extrapolated these costs to the size of the global population, based on the relative sizes of the populations in every income category, a 2% prevalence of last-year MSM behaviour,[41] and a 15% prevalence of HIV in MSM.[10] Further details are given in the appendix.

See Online for appendix

We estimated that a 25% reduction in HIV incidence in MSM worldwide would correspond to 0·5–1·0 million HIV infections averted in MSM in the next 10 years. To deliver oral pre-exposure prophylaxis on a global scale capable of achieving this reduction, the estimated global price tag in the coming year would be $26 billion, which is not feasible given present funding streams and commitments. Future costs are dependent on universal drug prices and thus might be substantially lower as those prices fall. In year 1, this strategy was projected to avert 100 000 infections, or a cost in year 1 of $235 000 per infection averted. Reduction of the price of emtricitabine–tenofovir to the globally available price of $0·31 would lower the global price tag of pre-exposure prophylaxis from $26 billion to $4·5 billion. Early ART was a similarly expensive strategy, with a global price tag of $26 billion in the coming year to set a course toward a 20% reduction in HIV incidence in 10 years, averting 75 000 infections ($350 000 per infection averted) in year 1—although, unlike pre-exposure prophylaxis, early ART has additional benefits to treated patients in addition to prevention of HIV transmission. Reduction of the price of ART medications in the USA to the price of ART in Peru lowered the corresponding price tag of early ART from $26 billion to $12 billion.

By contrast with pre-exposure prophylaxis and early ART—the cost of which to reduce HIV incidence in MSM would more than double the total scale of the HIV response in low-income and middle-income countries (some $15 billion in 2010)[42]—distribution of condoms and lubricant is an immediately affordable strategy. Even assuming that lubricant and distribution costs are 20 times higher than the production cost of condoms, a global investment of $134 million in the coming year (less than 1% of the global HIV response) could provide enough condoms and lubricant to set a course toward averting 25% of global HIV infections in the next 10 years. This strategy was projected to avert 120 000 infections in year 1, or about $1100 per infection averted in the first year. In the more realistic setting that lubricant and distribution cost only five times as much as condom production, this annual price tag is reduced to $34 million. An important area for future research would be to assess whether the achievement of such coverage levels in MSM worldwide is realistic. Even the most costly interventions, such as pre-exposure prophylaxis at current drug pricing levels would account for less than 0·5% of total global health-care expenditures (estimated at some $6 trillion per year in 2011).[43]

This analysis contains substantial limitations. First, we have extrapolated model-based data in four countries to represent the global population. The epidemics of HIV in MSM are heterogeneous,[35] which such global price-tag estimates do not capture. Many of the cost and effectiveness parameters (eg, under programme conditions, cost and coverage achievable with condoms) are uncertain. Thus, these calculations of a global price tag should be taken as order-of-magnitude estimates only. Finally, because HIV transmission is curbed through effective prevention, prevention efforts might ultimately result in cost savings (eg, from averted treatment) that are not included in this affordability

analysis. Here, we focus only on the annual costs needed to launch preventive efforts on a scale likely to have substantial population-level effect on HIV transmission. These up-front costs might overestimate cost requirements in the future if preventive efforts are successful.

In summary, a combined global preventive effort to prevent HIV in MSM is likely to cost up to $17 billion per year if pre-exposure prophylaxis and early ART are included. Although not feasible at present, this estimated cost could decline in future years if drug prices fell. Control of the HIV epidemic in MSM in lower-income regions is likely to be much less costly—as is prevention with distribution of condoms and lubricant. If we are to achieve measureable success in the prevention of HIV in MSM worldwide, and we must, we need to aggressively raise awareness—and funding, and work to lower the costs of antiretroviral medications.

A strategy for action on HIV in MSM

Given the severity of the global epidemic of MSM and HIV, and the scarcity of services, a strategy for clearly enhanced responses is called for. We propose here a four-part strategy. Figure 3 shows the strategy and its dynamic components, including inputs, actions, and outcomes. Panel 7 proposes accountability measures for the strategy and panel 8 lays out a timeline for action for 2012–14, when we will revisit progress at the 20th International AIDS Conference in Melbourne.

The proposed strategy includes:

(1) Overcome barriers to prevention, treatment and care for MSM. Overcoming barriers to services MSM will require: Decriminalisation of same-sex behaviours between consenting adults and repeal of discriminatory laws, policies, and practices that maintain homophobia, stigma, and discrimination. In some settings overcoming barriers might require strategic research to address marginalization and the exclusion of MSM in HIV responses; targeted programmes to reduce homophobia in health-care settings; and efforts to reduce homophobia and harassment at community, social, and national levels.

(2) Rapidly expand access to evidence-based services. HIV prevention, treatment, and care programmes with evidence for efficacy must be adequately resourced, taken to scale, and provided at levels commensurate with need. Evidence-based interventions for MSM should include, at a minimum, condom and safe lubricant promotion and distribution, access to safe and confidential HIV testing and counselling, STI care, antiretroviral therapy, and access to basic health care services consistent with dignity, autonomy, and equity. Cost analysis of an effective preventive response suggests that the first priority should be access to affordable and appropriate condoms and lubricants.

(3) Develop and implement coordinated donor and recipient plans for provision of services to scale for MSM.

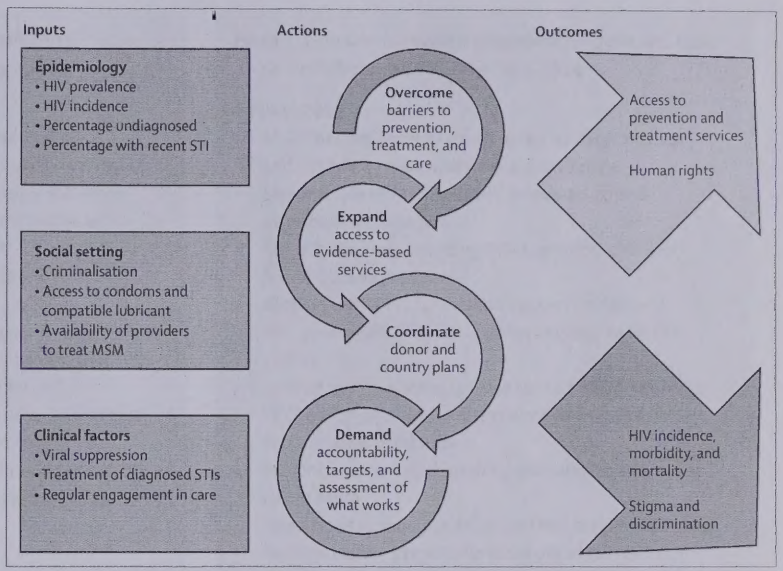

Figure 3: **Strategic framework for action on HIV in MSM**
STI=sexually transmitted infection. MSM=men who have sex with men.

Donor commitment to MSM and HIV is essential. Major government and private sector donors should develop a coordinated plan to address the HIV epidemic in MSM to maximise the effect of donor funds and leverage positive change. Donor cooperation with recipients and across sectors in this effort will be crucial in a period of limited or declining resources for global HIV. Donor plans must reflect the urgency of expanding epidemics of HIV among MSM and leverage donor influence to demand allocated resources reach key populations. Plans to reduce the cost of antiretrovirals for use in prevention and treatment, especially in wealthy countries, should be a priority.

(4) Set targets, measure progress, hold stakeholders accountable. National programmes and multi-national donors need to set bold but achievable targets for overcoming barriers, expanding services, and meeting programme goals for comprehensive provision of services for MSM. Progress measures need to be determined and regularly assessed. Community and civil society have crucial parts to play in holding governments and donors accountable for quality of reporting, resources, programmes, and outcomes and effects.

Discussion and conclusions

Gay, bisexual, and other MSM continue to endure disproportionate burdens of HIV disease worldwide. Much of this burden can be explained by biological and population level effects—and promising advances in the use of antiretroviral drugs for prevention and for treatment-as-prevention, might help address these realities. As Sullivan and colleagues[6] have shown, oral chemoprophylaxis and antiretroviral therapy, in

Panel 7: Assessment of the response to HIV/AIDS in gay men and other MSM—an accountability method

External funders

- Is there donor support for HIV epidemiological surveillance among men who have sex with men (MSM)?
- Are donor funds dedicated to addressing MSM needs commensurate with the epidemiological profile of countries in which the donor is active?
- Are MSM and HIV donor funding and programming tracked and the results made publicly available?
- Does the donor actively promote removal of country laws and policies that inhibit MSM access to health care?
- Is research, including operations research and demonstration projects, supported in order to improve service delivery and test use of new strategies?
- Is funding provided to non-governmental organisations to deliver services and advocate for legal and policy change to advance health access?

Governments

- Has the donor ensured funding is not provided to non-governmental organisations that actively work against human rights for sexual minorities?
- Have same-sex sexual practices been decriminalised or never criminalised?
- Are MSM included in the country's HIV epidemiological surveillance?
- Are domestic HIV funding allocations commensurate with epidemiological evidence on MSM?
- Are MSM addressed in the country's national AIDS strategy commensurate with epidemiological evidence?
- Are MSM civil society representatives engaged in planning and monitoring of domestic HIV efforts, and represented on the country's Global Fund Country Coordinating Mechanisms?
- Are there credible estimates of the percentage of MSM with access to basic HIV-related services, including condoms, lubricant, HIV testing, and antiretroviral therapy?
- If so, what coverage levels have been estimated in these areas?
- Has access to these services among MSM expanded in the last year?

Panel 8: Timeline for action—from Washington, DC, USA, 2012, to Melbourne, VIC, Australia, 2014

By July, 2013

- Major donors develop coordinated strategic plan to address HIV in men who have sex with men
- Donor funds to MSM and HIV work tracked and information made public
- Key populations, including MSM, prioritised in new funding announcements
- Global targets set for expanding service delivery and overcoming legal and policy barriers to health services
- Accountability system in place to track MSM-related or HIV-related legal and policy change and service delivery with external validation
- Evidence of increased funding dedicated to addressing HIV in MSM
- Operations research on MSM and HIV services launched
- Demonstration projects on MSM use of pre-exposure prophylaxis and comprehensive prevention (including treatment as prevention) launched
- Evidence of increased support to civil society for work to repeal laws and policies that inhibit access to care and enable stigma and discrimination, and to provide needed services and advocacy
- 10% more countries announce removal or repeal of laws that criminalise same-sex sexual behaviour
- 20% more countries include MSM in HIV epidemiological tracking
- 20% more countries adjust funding allocations to be consistent with domestic epidemiology and MSM
- 20% more countries include MSM in their national AIDS strategies

By July, 2014

- Report from major donors on their coordinated efforts
- First report of accountability system
- Targets met for expansion of service coverage and overcoming of legal and policy barriers
- Evidence of increased funding to address HIV in MSM
- MSM representatives on all country HIV planning bodies, including Global Fund Country Coordinating Mechanisms
- Evidence of increased support to civil society for work to repeal laws and policies that inhibit access to care and enable stigma and discrimination, and to provide needed services and advocacy
- 20% more countries announce removal or repeal of laws that criminalise same-sex sexual behaviour
- 40% more countries include MSM in HIV epidemiological tracking
- 40% more countries adjust funding allocations to be consistent with domestic epidemiology and MSM
- 40% more countries include MSM in their national AIDS strategies

combination with behavioural risk reduction strategies and condoms will probably be required to turn the tide on this component of the global epidemic, but present high costs will be a substantial barrier. Nevertheless, the new science is profoundly encouraging, and points for ways forward for more vigorous and effective responses.

Yet we must acknowledge that in 2012, we have failed in too many places to provide the most basic of services to these men. In much of the world, they remain hidden, stigmatised, susceptible to blackmail if they disclose their sexual lives, and criminalised, even in health-care facilities. New science and new implementation approaches will

mean little if these men cannot safely access HIV testing and counselling, affordable condoms, and safe lubricants. The estimated cost for full condom and lubricant access for MSM globally, some $134 million per year, is modest and achievable. Every effort must be made to ensure provision of these basic prevention methods.

It is now clear that prejudice and discrimination have helped maintain HIV burdens in MSM. That the current global generation of young people is changing the world we live in is equally clear. Sexual minority communities are communicating, engaging in political life, and demanding the right to participate in decisions that affect their lives, including those that relate to HIV programmes and policies. These are welcome changes, but this effort will not be simple or short lived. The struggle for equity in HIV services is likely to be inseparably linked to the struggle for sexual minority rights—and hence to be both a human rights struggle, and in many countries, a civil rights one. The history of AIDS is rich with examples of how affected communities pushed for inclusion—and of how their inclusion improved responses. For MSM this has been a many decades struggle. And it is not over by any means. Indeed, for many communities, countries, and regions, it has just begun.

Contributors

CB conceptualised the report and led the writing team; PSS contributed to the writing and led the research agenda section; JS contributed to the treatment and prevention sections; DD led the costing components; DA contributed to the political and human rights sections; GT contributed to the community and human rights sections; CC led the strategy section of the report; EK provided overall guidance and contributed to the conceptualisation of the report; MK contributed to the strategic and human rights components; MS contributed to the costing and the policy messages; KHM led the clinical and mental health writing components.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgments

This paper and the special theme series which it summarises was supported by grants to the Center for Public Health and Human Rights at Johns Hopkins University from amfAR, The Foundation for AIDS Research and from the Bill & Melinda Gates Foundation. The Johns Hopkins Center for AIDS Research (NIAID, 1P30AI094189-01A1) provided partial support to CB. The authors would also like to thank Susan Buchbinder and colleagues for assistance with the modelling, which was based on work done for their Prevention Umbrella for MSM in the Americas, PUMA (NIAID, R01-AI083060.). We would like to thank His Grace Archbishop Emeritus Desmond Tutu for his contribution. For the text box on the Commission on HIV and the Law, the Commissioners wish to acknowledge the contribution of Mandeep Dhaliwal and Jeffrey O'Malley. Stefan D Baral of Johns Hopkins contributed to figure 3 and Andrea Wirtz, faculty member in the Department of Epidemiology at Johns Hopkins, contributed to figure 1. Emily Clouse, research coordinator for the Center for Public Health and Human Rights, has supported all of the authors in the organisation and management of this effort.

References

1 MMWR. Kaposi's sarcoma and Pneumocystis pneumonia among homosexual men—New York City and California, 1981; **30:** 305–08.

2 Altman D, Aggleton P, Williams M, et al. Men who have sex with men: stigma and discrimination. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60920-9.

3 Trapence G, Collins C, Avrett S, et al. From personal survival to public health: community leadership by men who have sex with men in the response to HIV. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60834-4.

4 Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011; **365:** 493–505.

5 Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010; **363:** 2587–99.

6 Sullivan PS, Carballo-Diéguez A, Coates T, et al. Successes and challenges of HIV prevention in men who have sex with men. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60955-6.

7 Mayer KH, Bekker L-G, Stall R, Grulich AE, Colfax G, Lama JR. Comprehensive clinical care for men who have sex with men: an integrated approach. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60835-6.

8 US Department of State. US secretary of state Hillary Rodham Clinton to speak on global HIV/AIDS. Washington, DC; 2011. http://www.state.gov/secretary/rm/2011/11/176810.htm (accessed April 5, 2012).

9 American Foundation for AIDS Research. Achieving an AIDS-free generation for gay men and other MSM: financing and implementation of HIV programs targeting MSM. Washington, DC. 2012.

10 Beyrer C, Baral SD, van Griensven F, et al. Global epidemiology of HIV infection in men who have sex with men. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60821-6.

11 Fay H, Baral SD, Trapence G, et al. Stigma, health care access, and HIV knowledge among men who have sex with men in Malawi, Namibia, and Botswana. *AIDS and Behav* 2011; **15:** 1088–97.

12 Beyrer C. Global prevention of HIV infection for neglected populations: men who have sex with men. *Clin Infect Dis* 2010; **50** (suppl 3): S108–13.

13 Friedman MS, Marshal MP, Stall R, et al. Gay-related development, early abuse and adult health outcomes among gay males. *AIDS Behav* 2008; **12:** 891–902.

14 Lauby JL, Marks G, Bingham T, et al. Having supportive social relationships is associated with reduced risk of unrecognized HIV infection among black and latino men who have sex with men. *AIDS Behav* 2012; **16:** 508–15.

15 Millett GA, Peterson JL, Flores SA, et al. Comparisons of disparities and risks of HIV infection in black and other men who have sex with men in Canada, UK, and USA: a meta-analysis. *Lancet* 2012; published online July 20. http://dx.doi.org/10.1016/S0140-6736(12)60899-X.

16 Hall HI, Geduld J, Boulos D, et al. Epidemiology of HIV in the United States and Canada: current status and ongoing challenges. *J Acquir Immune Defic Syndr* 2009; **51** (suppl 1): S13–20.

17 Lewis NM. Mental health in sexual minorities: recent indicators, trends, and their relationships to place in North America and Europe. *Health Place* 2009; **15:** 1029–45.

18 Bostwick WB, Boyd CJ, Hughes TL, et al. Dimensions of sexual orientation and the prevalence of mood and anxiety disorders in the United States. *Am J Public Health* 2010; **100:** 468–75.

19 Wolitski RJ, Stall R, Valdiserri R. Unequal opportunity: health disparities affecting gay and bisexual men in the United States. New York, NY: OUP USA, 2007.

20 Hatzenbuehler ML, O'Cleirigh C, Mayer KH, et al. Prospective associations between HIV-related stigma, transmission risk behaviors, and adverse mental health outcomes in men who have sex with men. *Ann Behav Med* 2011; **42:** 227–34.

21 PEPFAR. Technical Guidance on Combination HIV Prevention for MSM. Washington, DC: PEPFAR; 2011.

22 WHO. Prevention and treatment of HIV and other STI among MSM and transgender people: recommendations for a public health approach. Geneva: World Health Organization, 2011.

23 Herrick AL, Lim SH, Wei C, Smith H, Guadamuz T, Friedman MS, Stall R. Resilience as an untapped resource in behavioral intervention design for gay men. *AIDS Behav* 2011; **15** (suppl 1): S25–29.

24 George C, Adam BA, Read SE, et al. The MaBwana Black men's study: community and belonging in the lives of African, Caribbean and other Black gay men in Toronto. *Cult Health Sex* 2012; **14:** 549–62.

25 Killen J, Harrington M, Fauci A. Gay men, AIDS research activism, and the development of HAART. *Lancet* 2012; published online July 20. http://dx.doi.org/S0140-6736(12)60635-7

26 Altman D. AIDS and the globalization of sexuality. *Social Identities* 2008; **14:** 15.

27 de la Dehesa R, Mukherjea A. Building capacities and producing citizens: the biopolitics of HIV/AIDS prevention in Brazil. *Contemporary Politics* 2012; **18:** 187–200.

28 Barroso C. From reproductive to sexual rights. Routledge Handbook of Sexuality, Health & Rights, 2010: 379–88.

29 Helfer L. Overlegalizing human rights: International relations theory and the Commonwealth Caribbean backlash against human rights regimes. *Columbia Law Review* 2002; **102:** 1832–39.

30 Jurgens R, Csete J, Amon JJ, et al. People who use drugs, HIV, and human rights. *Lancet* 2010; **376:** 475–85.

31 Csete J, Cohen J. Health benefits of legal services for criminalized populations: the case of people who use drugs, sex workers and sexual and gender minorities. *J Law Med Ethics* 2010; **38:** 816–31.

32 International Lesbian G, Bisexual, Trans and Intersex Association. http://ilga.org/ (accessed Feb, 14, 2012).

33 HIV and the Law: Risks, Rights & Health. The Global Commission on HIV and the Law (2012).

34 The Yogyakarta Principles; 2006. http://www.yogyakartaprinciples.org/ (accessed May 4, 2012).

35 Beyrer C, Wirtz A, Walker D, et al. The Global HIV Epidemics among men who have sex with men. Washington, DC: World Bank, 2011.

36 Jaffe HW, Valdiserri RO, De Cock KM. The reemerging HIV/AIDS epidemic in men who have sex with men. *JAMA* 2007; **298:** 2412–14.

37 Stephenson R, Sullivan PS, Salazar LF, et al. Attitudes towards couples-based HIV testing among MSM in three US cities. *AIDS Behav* 2011; **15** (suppl 1): S80–87.

38 Sullivan P, Stephenson R, Salazar L, et al. Prevalence of serodiscordance, seropositivity, and exclusionary factors in US male couples presenting for Couples Voluntary Counseling and Testing (CVCT): preliminary results. WELBC05; 6th International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Rome, Italy; July 17–20, 2011.

39 Levy A, Johnston K, Annemans L, et al. The impact of disease stage on direct medical costs of HIV management: a review of the international literature. *Pharmacoeconomics* 2010; **28** (suppl 1): 35–47.

40 Koppenhaver RT, Sorensen SW, Farnham PG, et al. The cost-effectiveness of pre-exposure prophylaxis in men who have sex with men in the United States: an epidemic model. *J Acquir Immune Defic Syndr* 2011; **58:** e51–52.

41 Adam PC, de Wit JB, Toskin I, et al. Estimating levels of HIV testing, HIV prevention coverage, HIV knowledge, and condom use among men who have sex with men (MSM) in low-income and middle-income countries. *J Acquir Immune Defic Syndr* 2009; **52** (suppl 2): S143–51.

42 WHO, UNAIDS, UNICEF. Global HIV/AIDS response. Epidemic update and health sector progress towards Universal Access. Progress Report 2011. Geneva: World Health Organization, 2011.

43 WHO. Global Health Observatory: World Health Statistics 2011. Geneva: World Health Organization, 2011.